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THE LANCET

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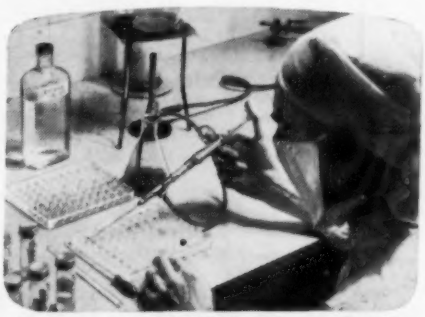

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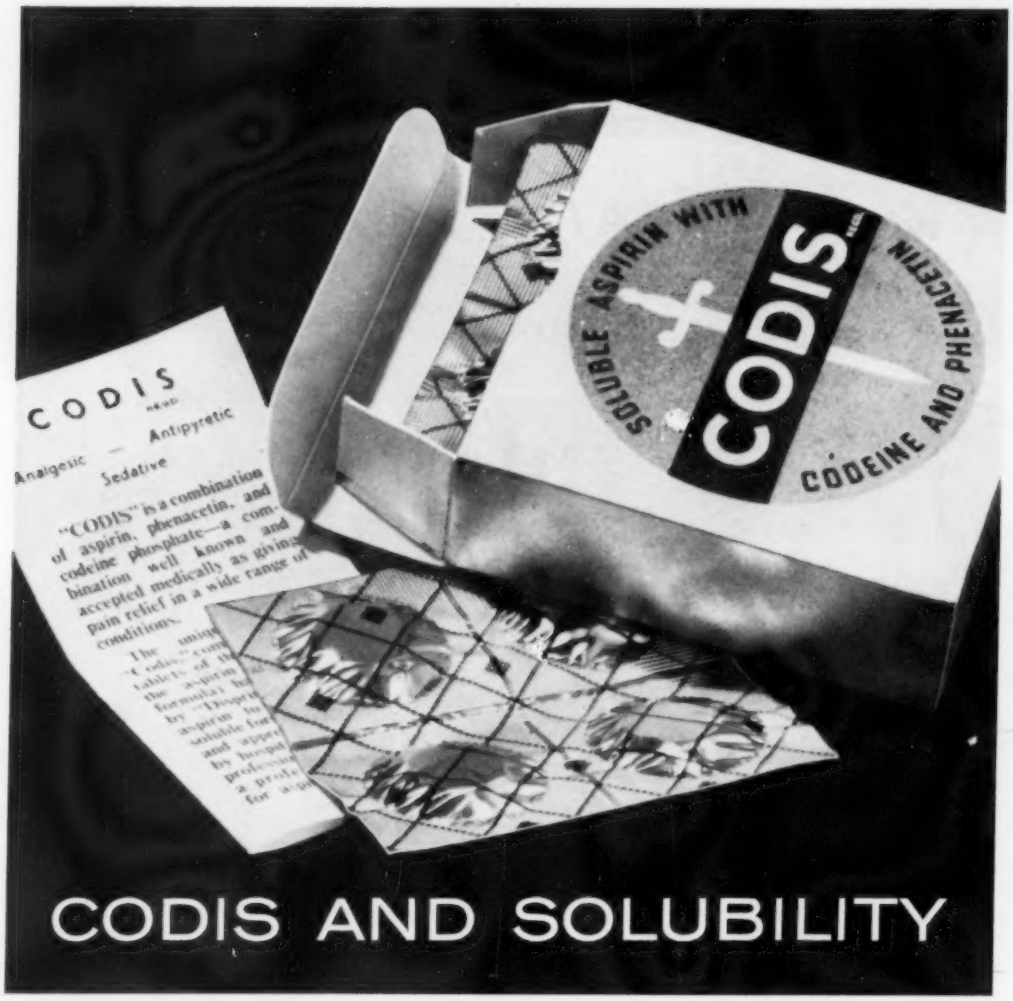
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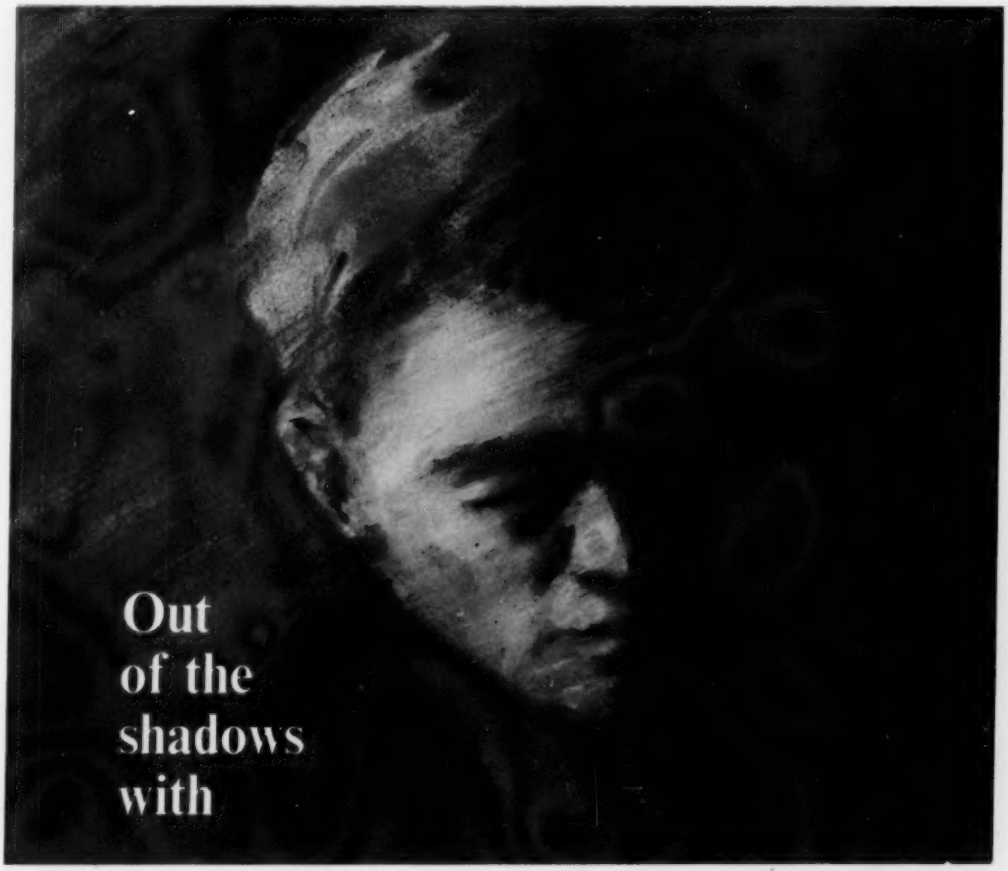

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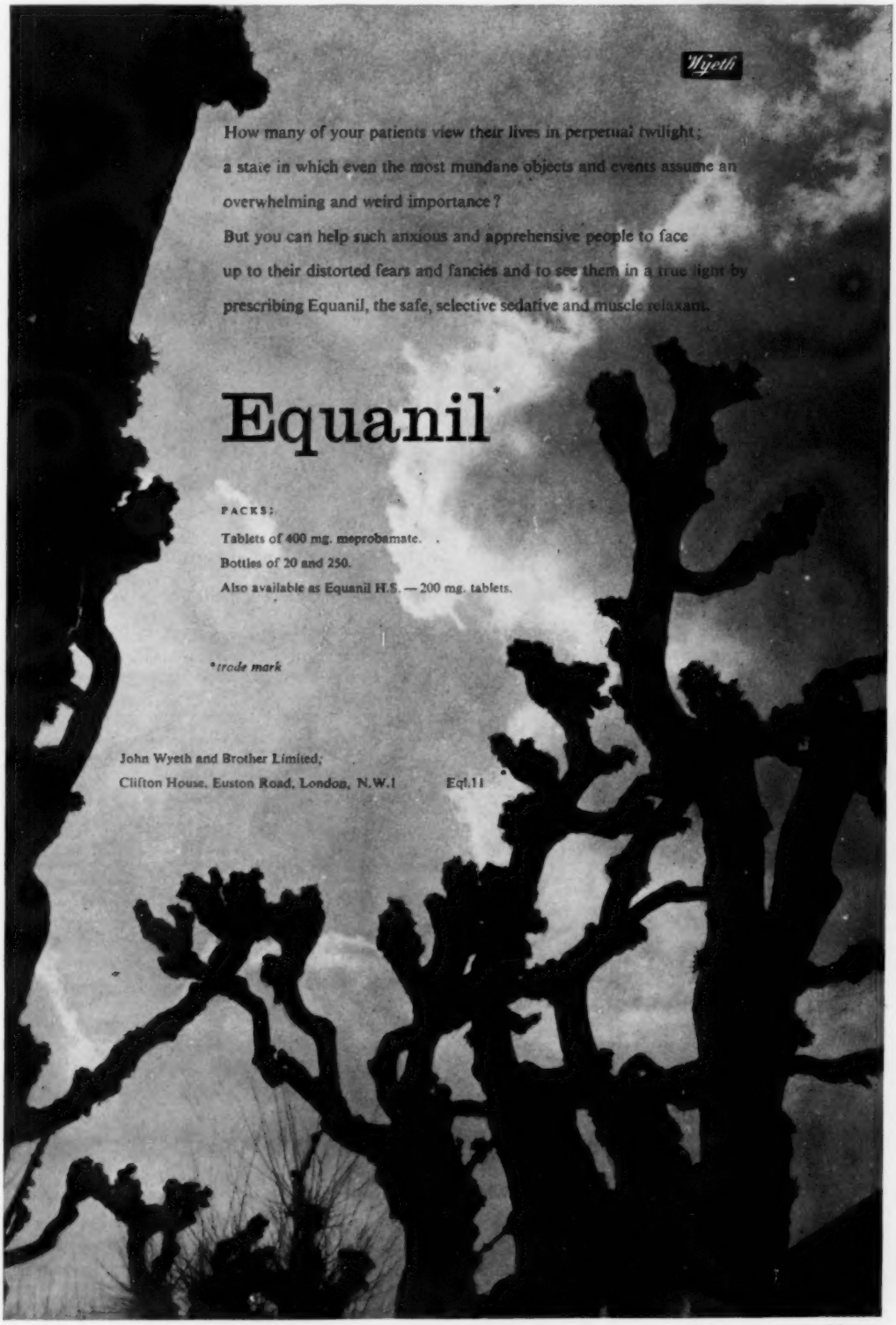
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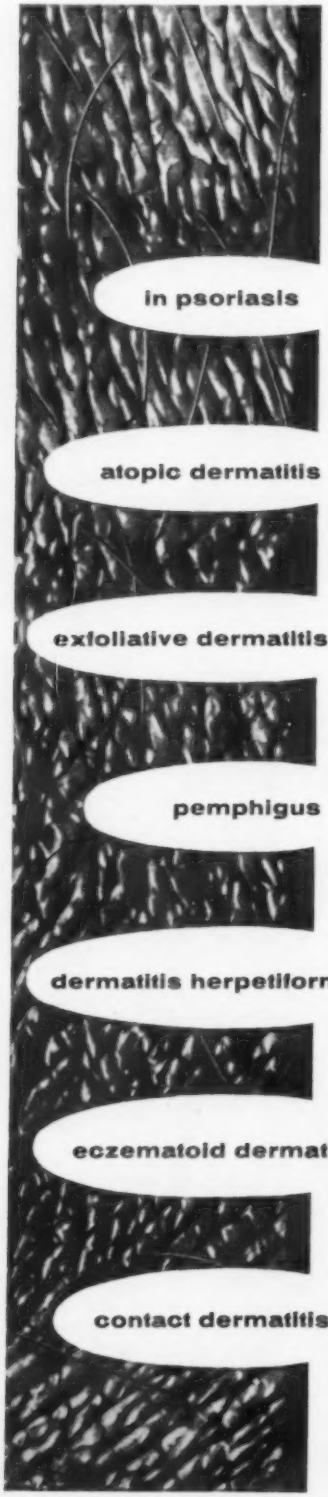

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Of all the theophylline derivatives, β-hydroxypropyltheophylline, resulting from original research by the Mellon Institute and usually known as B.H.T., has the widest range of therapeutic activity combined with minimum toxicity. Unlike most other derivatives it causes little or no gastric irritability. It is an excellent bronchodilator and coronary vasodilator and produces a notable diuresis. Many clinical trials have shown its efficacy.

INDICATIONS

- Bronchial asthma, chronic bronchitis, bronchiectasis and emphysema.
- Dyspnoeas associated with heart insufficiency, e.g., cardiac asthma, paroxysmal dyspnoea, Cheyne-Stokes respiration.
- Congestive heart failure, cardiac and pulmonary oedema, pulmonary congestion.
- Coronary insufficiency.
- Syncope.
- In some of these disorders, BRONTYL is a useful supplement to other therapies.

DOSAGE The normal dosage, which may be safely increased if desired, is 1-4 tablets, each tablet containing 120 mgm. of β-hydroxypropyltheophylline, 3 or 4 times a day. For emergencies BRONTYL is available in ampoule form each containing 2 mls. of a 15% solution.

Basic N.H.S. price in the United Kingdom: 25 tablets 3/6d, 100 tablets 10/6d, plus Purchase Tax. Brontyl may be prescribed on form E.C.10.

Distributed by

LLOYD-HAMOL LTD., 11 WATERLOO PLACE, LONDON, S.W.1

Brontyl is a trade mark of Lloyd-Hamol Ltd.

Relief of RHEUMATIC PAINS

with diethylamine salicylate

Algesal is the original skin-penetrating cream containing diethylamine salicylate. In 1955 a report of a clinical trial with Algesal appeared in the British Journal of Physical Medicine[1]. The report concluded:

"This preparation is a valuable addition to our therapeutic resources for the symptomatic relief of rheumatic pains. Clinical trial of 10% diethylamine salicylate cream *(Algesal)* showed significant relief of soft tissue rheumatic pains as compared with a dummy preparation."

Experimental work[2] has proved that diethylamine salicylate has a skin penetrative power 3 to 5 times that of other salicylates studied, and is completely non-irritating to the skin.

Over the past 5 years wide medical experience with Algesal has shown that symptomatic relief of common soft-tissue rheumatism can be achieved *without* counter-irritation, by the percutaneous route.

Algesal Balm contains the single active ingredient — 10% diethylamine salicylate — in a soothing vanishing cream.

It is indicated in all the rheumatic syndromes seen in general practice: fibrositis, lumbago, osteo-arthritis, tenosynovitis, pain and stiffness after exercise.

Pads of tear-off leaflets describing special remedial exercises are available for giving to patients with lumbo-sacral strain, osteoarthritis of the knee, frozen shoulder and painful foot strain.

1. March, 1955, p.62.
2. *C.R. Soc. Biol., Paris* (1948) **142**, 819.

Algesal

percutaneous salicylate cream for the relief of rheumatic pain by inunction

Samples and full descriptive literature available on request to

E.G.H. LABS. Peru Street, Salford 3, Lancs.

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— reliable, quick, no external heating —

A **NEW** COLOUR TEST

For **PROTEIN** ———— **ALBUSTIX*** *reagent strips*

For **BLOOD** ———— **OCCULTEST*** *reagent tablets*

For **GLUCOSE** ———— **CLINISTIX*** *reagent strips*

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. . . and, of course, for reliable estimation of

SUGAR ———— **CLINITEST*** *reagent tablets*

Range of six simplified urine tests for General Practitioners, hospitals, clinics and laboratories.

Please write for illustrated leaflet and references.

'Acetest' and 'Clinitest' are available under the N.H.S. on Form E.C.10. *(See drug tariff)*

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A completely new corticosteroid

in a class by itself

'DECADRON' is a completely new synthetic corticosteroid discovered in the Merck Sharp & Dohme Research Laboratories. 'DECADRON' has all the basic *therapeutic* actions of earlier steroids, but to a much greater degree. Although 'DECADRON' is *35 times* more potent than cortisone, *7 to 10 times* more potent than prednisolone, and *5 times* more potent than triamcinolone and methylprednisolone, the incidence of side-effects is the lowest ever reported. The change-over to 'DECADRON' from the older steroids is extremely simple.

'DECADRON' introduces an important change in steroid therapy, since therapeutic need—*not* side-effects—now becomes the predominant factor.

There will be ample supplies of 'DECADRON' available to meet all prescription demands.

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References: *Calif. Med.* (1958) **88**, 417.
Arthritis & Rheumatism (1957) **1**, 313.

Trade Mark

DECADRON

(Dexamethasone)

16alpha–methyl–9alpha–fluoro–prednisolone

'Decadron' is supplied as 0.5 mg. scored tablets, for oral administration, in bottles of 30 and 100.

MERCK SHARP & DOHME LIMITED, HODDESDON, HERTS.

THERAPEUTIC NEED—*NOT* SIDE-EFFECTS—NOW THE PREDOMINANT FACTOR

Now available o
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ROUSSEL **DEXA**

IN 1952, CORTISYL. Roussel Laboratories were first to manufacture **cortisone** and **hydrocortisone** in this country.

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9-α fluoro, 16-α methyl prednisolone

"This preparation, the most potent of any steroids heretofore studied, did not cause sodium retention or potassium loss in doses sufficient to suppress rheumatoid disease."

Arthritis and Rheumatism, 1958, **1**, 313.

— **Antirheumatic potency**.....about six times that of prednisone.

— **Side effects**.....only minor with normal dosage.

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— **Presentation**.....0.5 mg. scored tablets in bottles of 20.

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Obsolete

Gravitational Therapy

in Migraine

"You are old, Father William," the young man said,
"And your hair has become very white;
And yet you incessantly stand on your head—
Do you think, at your age, it is right?"

"In my youth," Father William replied to his son,
"I did it to cure the migraine;*
But now—why, I do it entirely for fun,
And take Cafergot when I'm in pain."

Cafergot

BY **SANDOZ**

aborts the attack of migraine in more than 80% of cases

* Standing on one's head is reputed to be a good cure for migraine[1] —but not every patient is so agile.

[1] *Brit. med. J.* (1957) 2, 633

TABLETS
1 mg. Ergotamine Tartrate B.P.
100 mg. Caffeine B.P.

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2 mg. Ergotamine Tartrate B.P.
100 mg. Caffeine B.P.
0.25 mg. total alkaloids of belladonna
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The esters of NICOTINIC, SALICYLIC and p-AMINOBENZOIC acids

bring relief to cases of arthritis and rheumatism

"Thank you, doctor"

IN CASES of soft-tissue rheumatism, and arthritic disorders, many doctors are tending more and more to regard Transvasin as an indispensable adjuvant to treatment.

For Transvasin is composed of the esters of nicotinic, salicylic and p-aminobenzoic acids. These esters readily pass the skin barrier in therapeutic quantities, and so enable an effective concentration of drugs to be built up where they are needed.*

Transvasin not only induces vasodilation of the skin with a superficial erythema, but also brings about a deep hyperaemia of the underlying tissues. It is non-irritant and can be safely used on delicate skins.

It is now being widely prescribed, with successful clinical results. Since a very small quantity is sufficient for each application, the cost of treatment is extremely low.

*Therapeutische Umschau 1952, 8, 143.

Tetrahydrofurfuryl salicylate	14%
Ethyl nicotinate	2%
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Water-miscible cream base ad	100%

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Only Nulacin provides intragastric milk-alkali drip therapy for the ambulatory patient

"In view of the ineffectiveness of most of the tableted antacids, the milk-alkali tablet (Nulacin) would appear to be the antacid of choice for ambulatory therapy."

(Medical Times 1958, **1**, 74)

NULACIN TABLETS have been developed so that when allowed to dissolve slowly in the mouth, they give continuous milk-alkali drip therapy and provide a treatment of peptic ulcer and other conditions associated with hyperacidity. The effectiveness of Nulacin therapy has been established by clinical work in many countries. The following are a few references to the literature:

Antacids. *The Practitioner*, January 1957, **178:** 43

Antacids in Peptic Ulcer. *The Practitioner*, January 1956, **176:** 103

Recent Advances in the Ulcerative Diseases of the Gastrointestinal Tract. *Amer. J. Gastro.*, December 1956, **26:** 665

Ambulatory Continuous Drip Method in the Treatment of Peptic Ulcer. *Amer. J. Dig. Dis.*, March 1955, **22:** 67-71

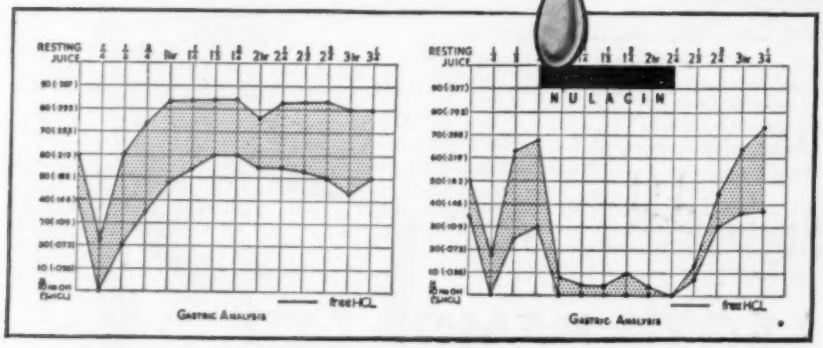
Management of Peptic Ulceration in General Practice. *Med. World*, December 1954, **81:** 591-601

Clinical Investigation into the Action of Antacids. *The Practitioner*, July 1954, **173:** 46

Further Studies on the Reduction of Gastric Acidity. *Brit. Med. J.*, 23rd January 1954, **1:** 183-184

Control of Gastric Acidity by a New Way of Antacid Administration. *J. Lab. & Clin. Med.*, 1953, **42:** 955

The Effect on Gastric Acidity of "Nulacin" Tablets. *Med. J. Aust.*, 28th November 1953, **2:** 823-824



Nulacin tablets have no B.P. equivalent and have been classified in categories 3 & 4 by the Joint Committee on Prescribing.
The basic N.H.S. price of the 25 tablet tube is 2/-.

Further information is available from:

HORLICKS LIMITED, PHARMACEUTICAL DIVISION, SLOUGH, BUCKS.

THE PROBLEM

To obtain high blood levels of theophylline easily . . . For oral aminophylline therapy to be fully effective it is necessary to give a dose sufficient to produce high blood theophylline levels. However, because of gastric irritation vomiting often results. Alternative therapy with enteric coated tablets or suppositories is unreliable, and parenteral aminophylline is inconvenient.

THE SOLUTION

Oral 'Theodrox' . . . The combination of dried aluminium hydroxide gel and aminophylline in 'Theodrox' ensures full therapeutic response with the minimum of gastric upset. Reproduceable blood levels comparable with those obtained from intramuscular injection can be obtained.

THE RESULT

A full Therapeutic response . . .

THEODROX REGD.

Recent work[1,2] has shown that synthetic derivatives of theophylline are mostly unsatisfactory and all are more expensive.

Each 'Theodrox' tablet contains 3 grains aminophylline and 4 grains dried aluminium hydroxide gel.
'Theodrox' is also available combined with $\frac{1}{8}$ grain phenobarbitone where a degree of sedation is also required.

REFERENCES

1. *Brit. Med. J.* (1957) *2*: 67
2. *Ibid.*, page 74

DOSAGE . . .

ASTHMA:— two tablets, repeated in 2-3 hours if necessary to control paroxysm and dyspnœa. For prophylaxis, one tablet 4 times daily.

DIURETIC:— two tablets initially, then one or two tablets three times daily.

ANGINA PECTORIS:— four to eight tablets daily. In suitable cases 'Theodrox' with Phenobarbitone tablets can replace some or all of the 'Theodrox'.

PACKS:— Bottles of 25, 100 and 1,000 tablets.

RIKER

'Theodrox' (Brit. Pat. 727831) is a registered Trade Mark of

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LOUGHBOROUGH LEICS.

Inability to take aspirin . . .

IT HAS BEEN reported (*Brit. med. J.*, 1: 444, 1957) that of 178 rheumatic patients, 25% could not take plain aspirin in adequate dosage.

Of this 25%, however, the great majority tolerated a modified aspirin such as Paynocil.

Not only are Paynocil tablets usually well tolerated by the stomach (even on the heavy dosage needed for rheumatoid arthritis), but they are extremely palatable, disintegrate instantly on the tongue without water, and cause no discomfort or unpleasant after-sensation.

. . . indicates PAYNOCIL

non-irritant, palatable, quick-dispersing aspirin

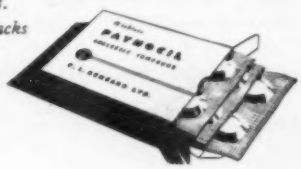
FOR ADULTS

PAYNOCIL

EACH TABLET CONTAINS

Acetylsalicylic acid ..... 10 grains
Aminoacetic acid..... 5 grains

PACKAGES in sealed foil strips:
Cartons of 18.
Dispensing packs of 240: basic N.H.S. cost (tax free) 21/8d.



FOR CHILDREN

Junior PAYNOCIL

EACH TABLET CONTAINS

Acetylsalicylic acid ..... 2½ grains
Aminoacetic acid ..... 1½ grains

PACKAGES in sealed foil strips:
Cartons of 20.
Dispensing packs of 240: basic N.H.S. cost (tax free) 12/-.

Detailed recommendations for dosage in rheumatoid arthritis will be gladly supplied on request

C. L. BENCARD LTD. PARK ROYAL, LONDON, N.W.10

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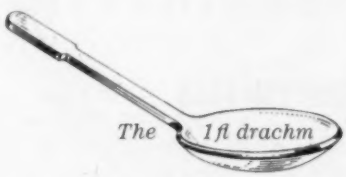
ORAL PENICILLIN

ready for instant use

any time—anywhere

CRYSTAPEN V ORAL LIQUID

This pleasantly flavoured suspension of calcium penicillin V is re-suspended in literally two shakes of the bottle. If stored in a cool place it is stable for two years. Thus you can carry Crystapen V Oral Liquid in your bag ready for instant use.



The 1 fl drachm measure provided delivers 16 doses (62·5 mg penicillin V as calcium salt) from each 2 fluid oz bottle.

GLAXO

GLAXO LABORATORIES LTD
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Subsidiary Companies or Agents in most countries

Also available

CRYSTAPEN V TABLETS

125 and 250 mg tablets of penicillin V as the potassium (K) salt

Crystapen is a Glaxo trade mark

These are the advantages of

Calcium B-PAS WANDER

and

B-Pasinah WANDER

(calcium B-PAS Wander plus isoniazid)

in the

Chemotherapy of Tuberculosis

B-PAS (Wander), 4-benzoylamino-2-hydroxybenzoic acid, first introduced by our Research Laboratories in 1948, is the drug of choice in regimens comprising PAS in concurrent therapy.

In the form of its calcium salt, it provides extended bacteriostatic levels, induces only minimal side-effects as compared with sodium PAS, and because of its high acceptability guarantees as far as possible that patients, particularly on domiciliary treatment, do take their medication.

Available in 3.5 g. envelopes and in 1 g. cachets; and as bulk powder.

'B-PASINAH' is available in two convenient forms:

Powders each containing 3.5 g. calcium B-PAS (Wander) and 87.5 mg. isoniazid.

Cachets each containing 1 g. calcium B-PAS (Wander) and 25 mg. isoniazid.

Full abstracts from literature, also details of institutional packs and prices from the Medical Department

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M.400

'Inversine' and 'Saluric' introduce

a New Era in the treatment of Hypertension

'SALURIC', already universally accepted as the only oral diuretic as effective as mersalyl, possesses the *unique* and *additional* property of *hypotensive activity*. Frequently it may be possible to control blood pressure with 'SALURIC' *alone* or with the addition of only a sedative or mild hypotensive agent. But when ganglion blocking agents are required in addition, the dosage and administration of these is greatly simplified.

LONGER LIFE FOR HYPERTENSIVES

'INVERSINE' and 'SALURIC' *concurrently* provide: Smaller dosage of 'INVERSINE'; Smoother control of blood pressure; Freedom from, or diminution in, side-effects usually associated with ganglion blockade.

How supplied:

'INVERSINE': 10 mg. tablets (white, quarter-scored); 2.5 mg. tablets (yellow, half-scored).

'SALURIC': 0.5 G. tablets (half-scored).

'Inversine' and 'Saluric' are not supplied in a combined tablet. 'INVERSINE' and 'SALURIC' were discovered and developed in the Merck Sharp & Dohme Research Laboratories, and are manufactured in England exclusively by the Merck Sharp & Dohme Organisation. 'Inversine' and 'Saluric' are Registered Trade Marks.

Please consult literature for dosage.

Inversine
MECAMYLAMINE HYDROCHLORIDE

Saluric
CHLOROTHIAZIDE

MSD MERCK SHARP & DOHME LIMITED, HODDESDON, HERTS

Effective Penetration of the Intact Skin

Vascutonex Cream

A TOPICAL SALICYLATE THERAPY WHICH INCORPORATES TWO ESSENTIAL FACTORS

Effective skin penetration

Effective absorption into lipid tissue

The first factor is provided by diethylamine salicylate which has been shown to have an absorption rate 300-500 times greater than methyl salicylate.*

The second factor is Glycol salicylate which has been shown to have a remarkable affinity for lipid tissue ensuring a deposit of salicylate ions, the slow release of which prolongs the action of the quicker acting diethylamine salicylate.

The local effect of these salicylates is to begin their therapeutic action at the site of the lesion. By plain inunction, about 80% of the salicylate content of the cream is taken up into the body and about 60% is excreted in the urine.

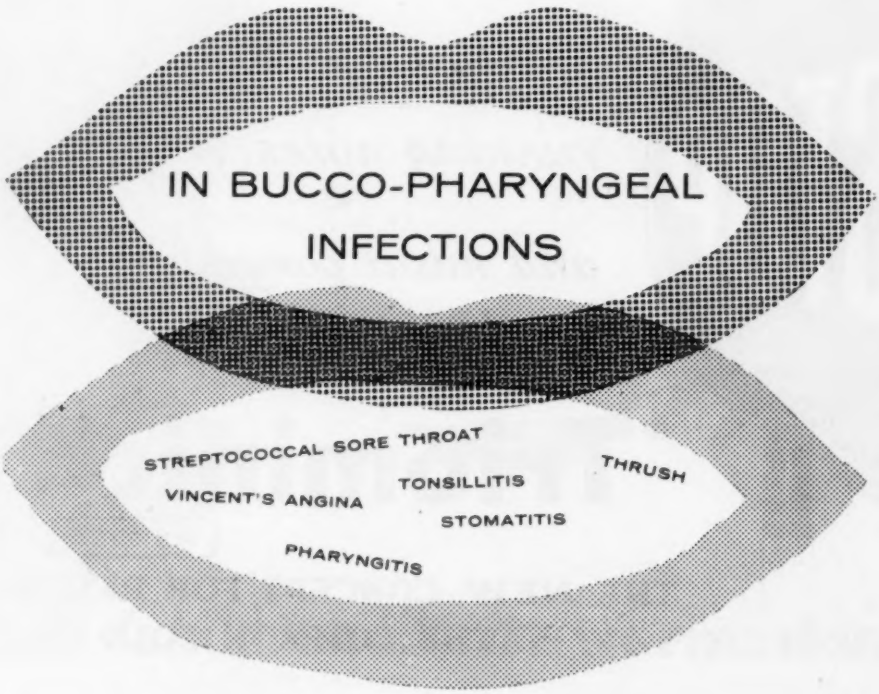
VASCUTONEX is non-staining, odourless, and contains no counter-irritants—its therapeutic action depending entirely on the effective absorption and anti-rheumatic action of the salicylates in the formula.

INDICATIONS: Fibrositis and pain associated with muscular and articular rheumatism and all soft tissue pain.

* (1948) *Comptes rend. Soc. de Biol.*, **142**, 819.

Formula
Glycol Salicylate . . . 10% w/w
Diethylamine Salicylate . . . 10% w/w
in a water miscible base.
Pack: 30 gramme tube.
Basic N.H.S. cost: 2/6d. plus P.T.

CALMIC LIMITED · Crewe: Crewe 3251-5
London: *2 Mansfield Street W1 · Langham 8038-9*



DEQUADIN

- rapidly and effectively controls the infection
- avoids the risks involved in local antibiotic therapy
- is more widely effective against oral pathogens than penicillin
- is fully active in the presence of serum
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DEQUADIN LOZENGES

Available as DEQUADIN LOZENGES, in tubes of 20 lozenges.

Dosage: One lozenge sucked slowly every 2 or 3 hours.

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running noses...

and nasal congestion

orally with

'Triominic'

WANDER

THE *NEW* CONCEPT FOR RELIEF OF THE COMMON COLD

Relief in minutes—lasts for hours

An orally administered decongestant has much better distribution to the mucous membranes of the respiratory tract than nasal sprays, drops and inhalants, and this "affords opportunity for shrinkage in areas that could not be approached by sprays, drops or actual topical application."*

'TRIOMINIC' "dries" and decongests nasal passages, combats allergic symptoms—with little likelihood of rebound congestion or pathological changes in the nasal mucosa, and without the risk of local overtreatment or "nose drop addiction." Especially valuable for night-time cough caused by postnasal drip.

* *Arch. Otolaryng.*, 1954, *59*, 48

Each "timed release" 'TRIOMINIC' Tablet contains:

Phenylpropanolamine-HCl ...	50 mg.
Mepyramine maleate B.P. ...	25 mg.
Pheniramine maleate ...	25 mg.

'Triominic' Wander is Schedule 4

Dosage: 1 tablet in the morning, afternoon and in the evening if needed. An average prescription is 12 tablets.

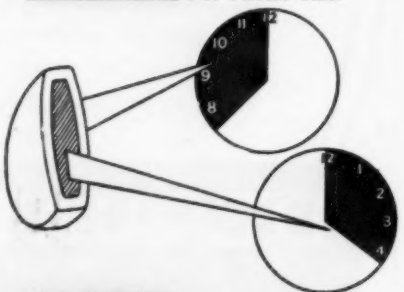
Packs: Supplied for dispensing in bottles of 50 and 250.

Price: N.H.S. Basic Price for 12 tablets (4 days' treatment) is 2/3d.

Also Available: 'Triominic' Syrup, for children and those adults who prefer a liquid medication, in bottles of 2 fl. oz. and 20 fl. oz. (dispensing). N.H.S. Basic Price for 2 fl. oz. is 1/10d.

'Triominic' "timed-release" tablets provide relief in minutes .... keep nasal passages clear for 6 to 8 hours.

FIRST the outer layer dissolves within minutes to produce 3 to 4 hours' relief



THEN the inner core disintegrates to give 3 to 4 more hours' relief

THUS 3 tablets daily 'unblock around the clock'

Literature and sample on signed request (S4) of physicians only M409

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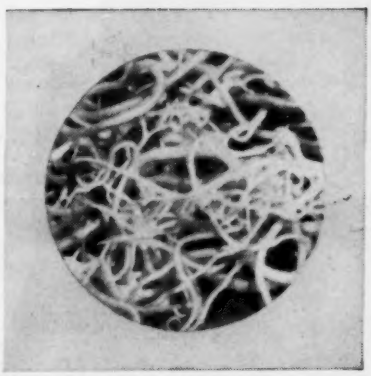
Children like *it*—**worms don't**

One week's treatment with 'Antepar' Elixir or Tablets is usually sufficient to eradicate *threadworms*, a single dose to clear *roundworms*, from the gut. Effective without fasting, purging or supporting measures, 'Antepar' acts by paralysing the worms—they are then expelled by normal peristalsis.

'Antepar' Elixir is supplied in bottles of 4 fl. oz. and 20 fl. oz. It contains the equivalent of 500 mgm. of piperazine hydrate per fl. dr. 'Antepar' Tablets, for chewing, are issued in strip packs of 20 and bottles of 250. One tablet is equivalent in strength to 1 fl. dr. of Elixir.



'ANTEPAR' TRADE MARK

BURROUGHS WELLCOME & CO. *(The Wellcome Foundation Ltd.)* LONDON

Tackling the 'cough problem'

Specific cough suppression
with local demulcent effect

PECTAMOL
LINCTUS TRADE MARK

The active constituent of the linctus is oxeladin citrate. Each teaspoonful (3.55 ml.) contains 10 mg.

ACTION
★ Depresses the activity of the cough centre

INDICATION
★ All forms of dry, unproductive cough

TOXICITY
★ Completely non-toxic ★ No constipation
★ No hypnotic effect ★ No habituation

DOSAGE
Adults 1 to 2 teaspoonfuls 4 times daily
Children ½ to 1 teaspoonful 4 times daily
Basic N.H.S. prices: Bottle of 60 ml. 2/6d. Bottle 250 ml. 8/9d.

Descriptive literature and specimen packing supplied on request.

BDH

THE BRITISH DRUG HOUSES LTD (Medical Department) · LONDON N.1

Announcing SYRUP

Trade **'V-CIL-K'** Mark PAEDIATRIC

This new paediatric syrup of 'V-Cil-K' gives even the youngest patient convenient and decisive penicillin therapy. Each 5 cc. contains 125 mg. penicillin V potassium — the most effective oral penicillin yet developed. Peak levels are attained within 30 minutes, from a syrup so pleasantly flavoured that regular dosage is assured.

The dose is ¼ to 1 teaspoonful four times daily.

Available in bottles to make 30 cc. and 60 cc., each with a 5 cc. plastic spoon.

SYRUP
'V-CIL-K'
PENICILLIN V POTASSIUM

Lilly

ELI LILLY AND COMPANY LIMITED, BASINGSTOKE, ENGLAND

DEAFNESS FOLLOWING MATERNAL RUBELLA

RESULTS OF A PROSPECTIVE INVESTIGATION

A. D. M. JACKSON
M.D. Lond., M.R.C.P., D.C.H.
ASSISTANT TO THE PROFESSOR OF CHILD HEALTH, INSTITUTE OF CHILD HEALTH, GREAT ORMOND STREET, LONDON, W.C.1

L. FISCH
M.D. Brno, D.L.O.
RESEARCH OTOLOGIST, AUDIOLOGY UNIT, INSTITUTE OF LARYNGOLOGY AND OTOLOGY (UNIVERSITY OF LONDON), GRAY'S INN ROAD, W.C.1

A NATIONAL prospective inquiry into the effects of virus infections during pregnancy has recently been carried out by the Ministry of Health. During 1956 and 1957 a subsidiary investigation was undertaken at the suggestion of the Ministry on some of the children from the national inquiry whose mothers had rubella during the first eighteen weeks of pregnancy. The purpose of this special investigation was to confirm or enlarge on the findings of the national inquiry by more detailed clinical examinations and extensive hearing tests in a selected group of children. The results will be included in the Ministry's report, which is in preparation, but the findings concerning deafness are thought important enough to merit early independent publication in greater detail. The Ministry's report will give a full account of the way in which the national inquiry was conducted and only those details which directly concern the present investigation will be given here.

Material and Methods

The register of the national inquiry, which was compiled at the time of the mothers' pregnancy, included 79 surviving children from the counties of London and Middlesex whose mothers had rubella during the first eighteen weeks of pregnancy. 57 of these children were still available for examination and constitute the rubella group. In all but 7 of the mothers the diagnosis of rubella had been confirmed by a doctor. A control group, consisting of 57 children whose mothers had no infection during pregnancy, was also examined.

The controls were taken from the national list and were matched with the rubella group for age, sex, county of birth, amd maternal age and parity. The ages in the rubella group ranged from 3 to 5 years (mean age 3 years 11 months); for the controls the range was from $3^1/_2$ to $5^1/_2$ years (mean age 4 years 2 months). In each group there were 30 boys and 27 girls.

The examination team consisted of a pædiatrician, an otologist, an educational psychologist, and an audiology technician with experience in testing young children.

The child's medical history was recorded but as far as possible no reference was made to a maternal history of rubella. Detailed clinical examinations were made by the pædiatrician and the otologist and included measurement of height and weight. Formal psychological testing was not done, but the educational psychologist gave advice on the intelligence and emotional state of the children when this seemed necessary.

Hearing Tests

Every effort was made to put the children at ease and to gain their confidence. In view of their ages the method of conditioning was used in all tests. The child was taught to respond to the test sound by performing a simple task, such as removing one of a nest of building beakers. Only when the examiners were satisfied that the response was reliable was the actual test begun.

Hearing was tested for a wide variety of sounds covering as many frequencies as possible. Voice tests were carried out in a quiet room by the otologist and the educational psychologist, both of whom were experienced in testing young children. Hearing for spoken words was tested by using a series of pictures of simple objects to which the child was asked to point on hearing the name of the object spoken by the examiner. The illustrations were chosen (by Mr. Michael Reed) to provide a wide range of consonant and vowel sounds. Hearing for other speech sounds, such as single consonants, was also tested.

Pure-tone-threshold audiometry, using the conditioning method, was carried out in a soundproof room by the audiology technician. Each ear was tested at octave frequencies from 128 to 8192 cycles per sec. No audiogram was accepted unless it was thought to represent a completely reliable response at threshold. At the time of testing, the audiology technician did not know to which group the children belonged.

Whenever the results of the hearing-tests were doubtful they were repeated—sometimes more than once. In this way reliable audiograms were obtained in all but 7 of the 114 children examined, and in these 7 the voice tests were considered adequate for the diagnosis of deafness to be confirmed or excluded.

TABLE I—MAJOR CONGENITAL DEFECTS IN RUBELLA GROUP

Defects	No. of cases	Maternal rubella: week of pregnancy *
Unilateral cataract, microphthalmos, nystagmus	1	4th
Unilateral cataract, congenital heart-disease (? pulmonary stenosis), congenital deafness	1	9th
Mental defect, congenital deafness	1	12th
Congenital deafness alone	12	6th–14th
Total number of children with major defects	15	4th–14th
Number of children with no major defects	42	0–18th
Total number of children examined	57	0–18th

* Calculated from the first day of the last menstrual period.

Results

Table I summarises the major congenital defects found in the rubella group and indicates the stage of pregnancy

TABLE II—RUBELLA GROUP: INCIDENCE OF CONGENITAL DEAFNESS ACCORDING TO WEEK OF PREGNANCY IN WHICH MATERNAL RUBELLA OCCURRED

Rubella: week of pregnancy	No. of children examined	No. of children with congenital deafness
0–3rd inc.	4	0
4th	4	0
5th	3	0
6th	1	1
7th	2	0
8th	4	0
9th	3	1
10th	5	3
11th	3	1
12th	9	6
13th	5	1
14th	1	1
15th	1	0
16th	1	0
0–16th inc.	46	14 (30·4%)
17th	6	0
18th	5	0
Total	57	14 (24·5%)

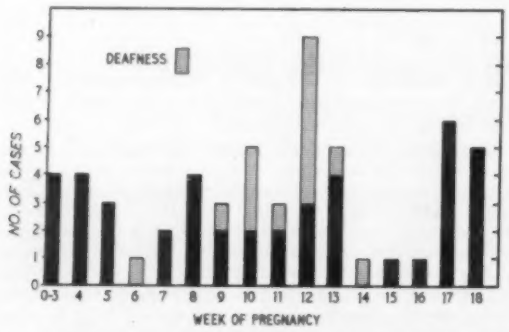


Fig. 1—Rubella group. Distribution of cases according to week of pregnancy in which maternal rubella occurred. The hatched portion of the columns indicates cases with congenital deafness.

at which the mother's rubella infection took place, the week of pregnancy being calculated from the first day of the last menstrual period. Of the 57 children in this group, 15 had major congenital defects and 42 did not, giving an incidence of 26·3% for major defects following rubella in the first eighteen weeks of pregnancy. In the control group no major defects were detected. In both rubella and control groups there were a small number of children with minor congenital defects or minor degrees of acquired conductive deafness.

Table II and fig. 1 show the distribution of cases in the rubella group according to the week of pregnancy in which the maternal rubella occurred. The overall incidence of congenital deafness was 24·5%. All the cases of congenital deafness were in children whose mothers had rubella between the sixth and fourteenth weeks of pregnancy. However, in view of the relatively small number of children examined and the difficulty of calculating the exact duration of pregnancy, it would be wrong to conclude that deafness cannot result from rubella occurring outside this period. We have therefore allowed a margin on either side and have calculated the risk in relation to the first sixteen weeks. This would include the child with eye defects alone whose mother had rubella at the fourth week of pregnancy (table I) and would exclude the 11 children with no defects whose mothers had their infection in the seventeenth and eighteenth weeks (table II). Thus the incidence of congenital deafness following rubella in the first sixteen weeks of pregnancy was 14 out of 46 children at risk (30·4%). When the additional child with eye defects alone is included the total incidence of children with major defects for this period of pregnancy is 15 out of 46 (32·6%).

TABLE III—TYPES OF DEAFNESS (BOTH GROUPS)

—		Rubella group		Controls
No. of children examined		57		57
Slight acquired conductive deafness		5		5
Severe congenital perceptive deafness	Bilateral (both ears severe)	6*	14	0
	Bilateral (one ear slight)	3		
	Unilateral	5		

Deafness

A diagnosis of deafness was made if the audiogram showed a hearing loss of 20 decibels or more in at least two adjacent frequencies, or a loss of 30 decibels or more in a single frequency. In 2 of the 7 children for whom reliable audiograms could not be obtained a diagnosis of severe bilateral deafness was made on the results of other

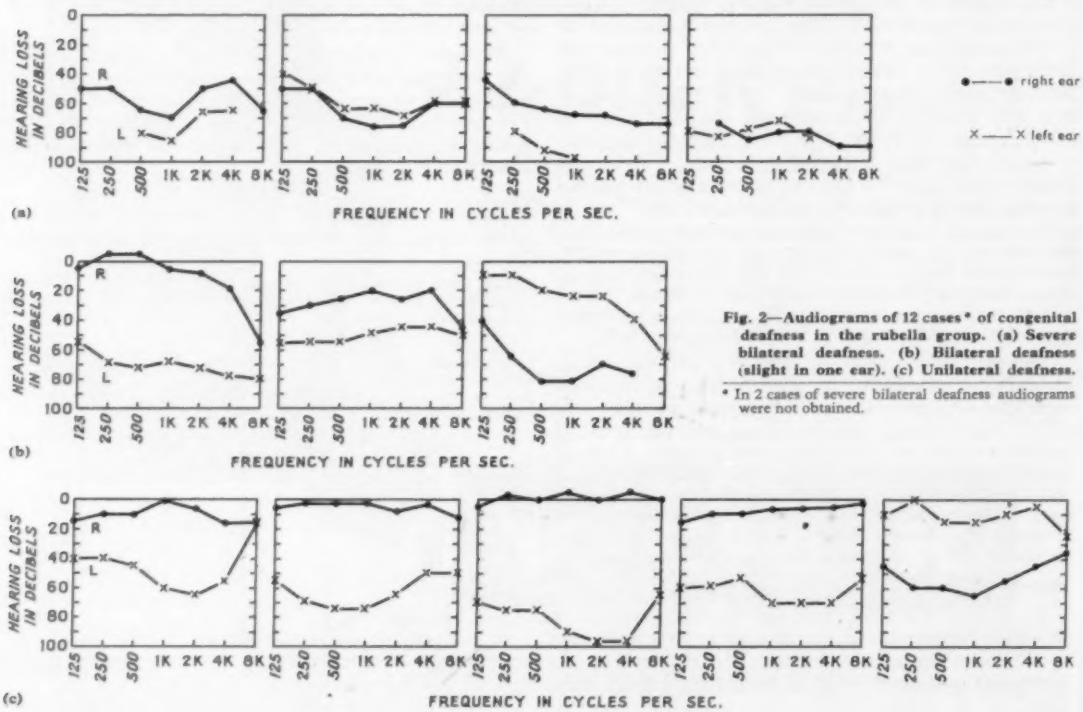


Fig. 2—Audiograms of 12 cases* of congenital deafness in the rubella group. (a) Severe bilateral deafness. (b) Bilateral deafness (slight in one ear). (c) Unilateral deafness.

* In 2 cases of severe bilateral deafness audiograms were not obtained.

TABLE IV—INCIDENCE OF UNDETECTED DEAFNESS (BOTH GROUPS)

		Rubella group		Controls	
		Total	Undetected	Total	Undetected
Acquired deafness		5	5	5	5
Congenital deafness	Bilateral (both ears severe)	6	1	0	0
	Bilateral (one ear slight)	3	3		
	Unilateral	5	5		

hearing tests. 1 of these deaf children was mentally defective and the conditioning method could not be used. In this case, therefore, more detailed observations of the child's reactions to various types of sound stimuli were necessary for the diagnosis of deafness to be established. The remaining 5 children were considered to have normal hearing; but, in the absence of reliable audiograms, the possibility of minor degrees of hearing loss could not be excluded.

The results of the hearing tests are given in table III. In each group there were 5 children (8·8%) with a slight degree of conductive deafness due, presumably, to acquired middle-ear disease. Such deafness is not uncommon in children but is of some importance since it may be the early stage of a progressive lesion and may require treatment.

Of far greater importance was the finding of 14 cases of severe congenital perceptive deafness among the 57 children of the rubella group (fig. 2). No case of congenital deafness was found in the control group.

Of the cases of congenital deafness, 6 had severe bilateral deafness, causing delay in speech development or complete absence of speech and requiring specialised treatment at a very early age (fig. 2a).

In 3 cases the deafness, although bilateral, was severe in only one ear, the other being much less severely affected (fig. 2b). Such deafness is not usually associated with speech defects but may result in educational and emotional difficulties. Children with this type of deafness are often unjustly accused of being inattentive or disobedient at school and may even be considered backward because they miss much of what is said in the classroom.

In 5 children there was true unilateral deafness with normal hearing in one ear (fig. 2c). Unilateral deafness is usually symptomless, but in unfavourable circumstances may be a handicap. If, for example, a child with unilateral deafness sits in a classroom with his good ear to a noisy window he will suffer the same disabilities as the child with bilateral deafness. Furthermore, there is always a potential risk of the hearing in the good ear becoming impaired by acquired middle-ear disease. Inability to locate the source of a sound is a further disadvantage of unilateral deafness.

There was no significant correlation between the severity of deafness and the severity of the maternal rubella. In the mothers of the children with congenital deafness the mean time of onset of rubella was the eleventh week of pregnancy, but the severity of the deafness was unrelated to the stage of pregnancy at which rubella occurred.

TABLE V—SPEECH DEFECTS (BOTH GROUPS)

Hearing		Speech		
		Severe defects	Slight defects	Normal
Acquired deafness		0	1	9
Congenital deafness	Bilateral (both ears severe)	6	0	0
	Bilateral (one ear slight)	1	0	2
	Unilateral	0	0	5
Normal hearing		0	14	76

Audiogram Patterns

Most of the audiograms in the cases of congenital deafness were " flat " with a similar degree of hearing loss in all frequencies (fig. 2). In some cases the pattern was varied by a more severe loss in the middle frequencies (producing a " trough ") or in the higher frequencies (producing a sloping graph). This tendency to a uniform audiogram pattern in rubella deafness has been reported by other observers (Murray 1949, Goodhill 1950, Hiller 1950). Fisch (1955), comparing the audiogram patterns in various types of congenital deafness, showed that in spite of individual minor variations there was a general tendency for each ætiological type of deafness to be associated with a characteristic audiogram pattern, which for rubella deafness was a " flat " or a gently sloping curve with the greater hearing loss in the higher frequencies.

In no case was deafness complete; usually there was a considerable amount of residual hearing.

In the 8 audiograms showing marked asymmetry between the two sides, the hearing loss was greater on the left in 6 and on the right in 2.

Undetected Deafness

Before the present investigation was undertaken the diagnosis of deafness had been made in only 5 of the 24 cases in both groups (table IV). The children had previously been examined at the ages of 1 and 2 years according to the scheme of the national inquiry, but hearing was not tested unless there were symptoms suggesting deafness. The commonest symptom of severe deafness is delayed or defective speech; but when deafness is not severe there may be very little disturbance of speech. Table V shows the incidence of speech defects in relation to hearing in the children of both groups. Only 7 children had severe speech defects and all of these had bilateral congenital deafness; in 5 of the 7 the diagnosis of deafness had been made by the age of 2 years. The other children with congenital and acquired deafness did not have severe speech defects and the diagnosis had not therefore been suspected. Slight defects of speech (mostly minor articulation defects) were noted in 15 children, none of whom had serious hearing loss.

The hearing loss in the 10 cases of conductive deafness was slight, and it is not surprising that such deafness should have passed unnoticed. The high proportion of undetected congenital deafness in the rubella group is, however, of considerable importance.

Other Defects

Only 3 children in the rubella group had major congenital defects other than deafness (table I). These had all been diagnosed in the main national inquiry, and as the number of children concerned is so small we have nothing to add on this subject.

In addition to deafness the conditions most likely to have been overlooked by the national inquiry are congenital abnormalities of the retina (Marks 1946) and minor degrees of mental defect. Unfortunately the necessary examinations for these conditions could not be made in the present investigation.

It was our clinical impression that the 4 children with the most severe degree of bilateral deafness showed an abnormal behaviour pattern. These children tended to be restless, destructive, spiteful, and unable to concentrate;

but more detailed behaviour and intelligence studies would be necessary to determine the cause of this behaviour and its relation to deafness or to brain damage unassociated with deafness.

A statistical analysis of the weights at birth and of the heights and weights at the time of examination will be included in the Ministry of Health report. The only finding of statistical significance was that at the age of 4 the children with rubella deafness weighed less than the controls. Certain other tendencies were noted but larger numbers of deaf children would have to be examined to be certain that these were not due to chance alone.

Discussion

Since the original observations of Gregg (1941) much has been written on rubella in pregnancy. The early reports, based on retrospective studies, suggested that the incidence of congenital defects, including deafness, was very high in children whose mothers had rubella in the first three months of pregnancy. Later prospective investigations showed it as much lower but, with two exceptions, gave no indication of the risk of deafness.

Our investigation is, we believe, the first to include detailed hearing tests with audiograms on a group of children from a prospective series. The group is to some extent selected, because it includes only liveborn children from the national inquiry who survived to the age of 4 years and lived in the London area. Our results show a high total incidence of congenital deafness, which was unilateral in over 30% of cases and was previously undetected in over 60%.

Asymmetry between the two ears in the audiograms of children with rubella deafness has been recorded previously (Murray 1949, Hiller 1950). True unilateral deafness, however, has not been reported except in brief references to single cases (Carruthers 1945, Hiller 1950) for which no clinical details or audiograms are given. Audiograms have been studied by Murray (1949), Goodhill (1950), Hiller (1950), and Fisch (1955) in a total of 214 cases of congenital deafness due to rubella, but in none of these was the deafness unilateral. The high incidence of congenital unilateral deafness in the present series (5 out of 14 deaf children) is therefore a new observation but not a surprising one in view of the well-recognised occurrence of unilateral cataract following maternal rubella.

The fact that 9 out of 14 cases (62·4%) of congenital deafness had not been detected by the age of 4 years indicates the importance of detailed hearing tests, including audiograms, in the diagnosis of rubella deafness in young children.

The incidence of congenital deafness following maternal rubella in the first sixteen weeks of pregnancy was 30·4% (31·5% if only the first twelve weeks of pregnancy are considered). These figures are considerably higher than those obtained in other prospective inquiries.

In Lundström's (1952) series of 579 infants whose mothers had rubella in the first four months of pregnancy the incidence of all congenital malformations in infants surviving the neonatal period was only 4·5%. Greenberg et al. (1957) combined their own results with those of ten other prospective investigations and obtained a figure of 12·9% for the incidence of congenital defects in a total of 116 live births following maternal rubella in the first three months of pregnancy. In these investigations no cases of deafness were recorded; but no examinations were made later than one year after birth. In our own series only 2 out of the 14 cases of congenital deafness were severe enough to be diagnosed at the age of 1 year. At this age audiometry is impossible and even the simpler forms of hearing test are difficult.

In two recent investigations the children were followed up for longer periods, and the incidence of deafness was low compared with our findings; but hearing tests were not done.

Lamy and Seror (1956) in France found a surprisingly high incidence of congenital abnormalities. Of 40 children born alive after maternal rubella in the first 16 weeks of pregnancy 23 (57·5%) had major defects. Deafness, however, was found in only 3 (7·5%).

The report of Bradford Hill et al. (1958) included 21 infants born alive after maternal rubella in the first 16 weeks of pregnancy. In this group the incidence of deafness detected by the age of 3 years was 9·5% and the total incidence of congenital defects was 23·8%. Our results provide a similar figure (10·8%) for the incidence of deafness if only those cases are included which were severe enough to be detected before the age of 4 years by clinical examination alone.

It is obvious that, by relying on a relatively short follow-up and examinations without hearing tests, previous investigations have either overlooked deafness or have detected it only when severe. We have shown that milder cases do occur and cannot be dismissed as unimportant.

We believe that our results are reliable and are not biased in favour of the diagnosis of congenital deafness in the rubella group. This claim is supported by the objective evidence of the audiograms, which were made in both rubella and control groups, without knowledge of the group to which the children belonged.

Summary and Conclusions

To obtain a reliable estimate of the risk of deafness from maternal rubella, investigations must be prospective and must include detailed hearing tests with audiograms on all surviving children. The children must therefore be followed up for at least four years.

In the first reported investigation satisfying these criteria we have found the incidence of congenital deafness following maternal rubella in the first sixteen weeks of pregnancy to be approximately 30%; in a third of the cases the deafness was unilateral.

Any child whose mother gives a history of rubella in early pregnancy—even if his hearing appears to be normal—should be followed up until such time as audiometry can be carried out to exclude the possibility of deafness.

We should like to express our thanks to the many people who contributed to the success of this investigation. Mr. Michael Reed (educational psychologist) and Miss J. Quinn (audiometry technician), of the audiology unit of the Institute of Laryngology and Otology, assisted with the examinations; Miss N. Oliver, superintendent health visitor, London County Council, was in charge of the arrangements for the examinations at the Province of Natal Welfare Centre, London; Dr. J. A. Scott and Dr. A. C. T. Perkins, medical officers of health for the counties of London and Middlesex, were responsible with their staffs for ensuring the children's attendance for examination; and the staff of the General Register Office supplied information about the children and their mothers from the records of the national inquiry and selected the matched controls. We are indebted to the Ministry of Health for the opportunity of carrying out this work and to Prof. Alan Moncrieff and Miss Edith Whetnall for their encouragement and advice.

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TREATMENT OF CHRONIC ASTHMA WITH PREDNISOLONE

SIGNIFICANCE OF EOSINOPHILS IN THE SPUTUM

H. MORROW BROWN
M.D. Edin., M.R.C.P.E.
CONSULTANT CHEST PHYSICIAN, DERBY CHEST CLINIC, AND DERWENT HOSPITAL, DERBY

THE Medical Research Council subcommittee on clinical trials in asthma found no real advantage in cortisone acetate in the treatment of chronic asthma, compared with bronchodilator drugs (Medical Research Council 1956)—a result which surprised those whose experience indicated that corticosteroids are often of great value. Analysis of the M.R.C. trial suggested that its methods were not beyond criticism; so general practitioners in the Derby area were asked to refer chronic asthmatic patients to the chest clinic to take part in another trial on different lines using prednisolone. This began in January, 1957, and included patients who were already receiving steroid therapy, as well as those who joined the trial later. There were 90 patients in all.

To produce a clear-cut result, entry to the trial was limited to those patients who had had chronic bronchospasm for at least a year, and who had proved refractory to all other forms of treatment over at least one month. The only exceptions were a few cases in which the general practitioner had already given bronchodilators an adequate trial, and in which bronchospasm was very severe. Severe chronic bronchial infection and bronchospasm of cardiac origin were excluded, but cor pulmonale, even with congestive failure, was not considered a contraindication. Prednisolone was thus used as a last resort only, so that its efficacy could be as sternly tested as possible.

Early in the trial it was found that the distinction between asthma and chronic bronchitis with predominant bronchospasm was extremely difficult, especially in elderly men, in whom the results of steroid therapy seemed generally poor and totally unpredictable. In fact, a few months after the trial began the results were about half good and half bad, mainly because of this type of patient being included.

At the same time there was a group of younger patients distinguished by recurrent infection and bronchospasm who responded temporarily to antibiotics, only slightly to bronchodilators, and in whom sputum culture and sensitivity testing proved a most unhelpful guide to treatment. The finding of eosinophilic sputum in some chronic bronchitics (May 1954) suggested cytological examination of their sputum, and it was eventually found that no less than 16 patients with this clinical picture, who had been confidently thought to be chronic bronchitics for up to three years, had eosinophilic sputum and responded dramatically to prednisolone, with relief of bronchospasm and usually cessation of recurrent bronchial infections.

Negative laboratory reports when eosinophils were expected to be abundant prompted the improvisation of a quick and easy method of examining the sputum and made it possible to separate the true asthmatics with eosinophilic sputum from the others with ease and accuracy.

The success of this method suggested that it might be interesting to examine the sputum of patients having prednisolone. Corticosteroids clear the blood of eosinophils, but it was soon found that this did not happen in the sputum. What was even more interesting was that the results indicated that eosinophils in large numbers in the sputum were associated with a good response to prednisolone, and few or no eosinophils with a poor response.

With experience, certain aspects of clinical examination became evident. Often bronchospasm could be demonstrated only by forced exhalation through the open mouth. Others would not admit a single wheeze, breath sounds and respiratory excursion were both much diminished, and extremely high-pitched capillary bronchospasm could be elicited only by expressing the residual air by forcible manual expression (Power 1958) while continuing to auscultate with a diaphragm-type stethoscope. These patients were often the most dyspnœic and the lack of physical signs had led to the suspicion of cardiac disease. This may be the type of case referred to (Stuart-Harris and Hanley 1957) as " some patients with bronchospasm do not wheeze, though their distress is greatly improved by broncho-dilator drugs ".

Treatment

Except when bronchospasm was very severe, the dose given was 5 mg. thrice daily for a week, followed by reassessment and adjustment of dose.

Patients were told that if wheezing disappeared during the first week they could reduce the dose after a few days, but the majority did not do so. In favourable cases wheezing had ceased when they were seen a week later, and the dose could then be reduced. It was seldom necessary to increase the dose. All patients were given brief notes warning them of the dangers involved in prednisolone therapy. As a further safeguard notes on the dangers of treatment were issued to family doctors, and patients were given another copy of the notes in a sealed envelope to be given to their doctor if he did not have the case-notes to hand, as, for instance, when he was called at night.

Each patient was told to take as little prednisolone as possible to keep him free from wheezing. When wheezing had ceased for a few days the dose was reduced by 2·5 mg. every three days until wheezing returned slightly. It should then be increased by 2·5 mg. so that wheezing disappeared again, and then continue at that level for about ten days, when a further attempt should be made to reduce the dose. Thus, the patient was constantly trying to reduce the dose and finally stop treatment. Many remained free of symptoms on from 7·5 to 2·5 mg. per day, and others were able to stop altogether; though few could remain symptom-free for long.

Cooperation was remarkably good, and often patients were too enthusiastic in reducing dosage, so that spasm got out of hand and 15 mg. a day was needed for a week or so to control it. Any acute spasm was dealt with by increasing the dose abruptly until it was controlled, and then immediately beginning to reduce again. Patients were told to do this on their own, and not one has had any difficulty or catastrophe.

With these methods and by careful supervision and the use of antibiotics when needed, the risk of side-effects and complications was minimised, and suppression of endogeneous secretion and possible adrenal atrophy were unlikely. When necessary however, much higher doses were given for short periods, and a good working rule was found to be to double the dose at once if in doubt. If the sputum was purulent, a course of tetracycline always preceded the beginning of prednisolone therapy.

Eosinophils in the Sputum

Large numbers of eosinophil leucocytes, and sometimes Charcot-Leyden crystals and Kurschmann's spirals, are to be found in the sputum of asthmatic patients, but these findings have so far had no bearing on treatment.

Collection of Specimens

The rapid consulting-room method which was evolved depends on persuading the patient to produce a sample of genuine sputum in a petri dish, where it is much easier to pick out with forceps against a dark background the most promising piece of sputum. Only by insisting on the production of a specimen before the patient left the clinic could suitable samples be obtained, and much encouragement was often needed.

Many asthmatics have great difficulty in producing sputum, especially later in the day. Quite often only a tiny piece of mucus, not much bigger than a pin head, swimming in saliva, could be produced. This would almost certainly have been overlooked in the usual container, but proved to be crowded with eosinophils. Patients seldom produce a satisfactory specimen unless they are supervised, especially children, and specimens sent by post were seldom satisfactory and sometimes disgusting. Children, encouraged by a little postural coughing, can often produce a minute but diagnostic sample when the parents swear that the child has never coughed anything up in its life. Occasionally it was necessary to visit the home early in the morning to get a diagnostic specimen.

Macroscopic Appearances

Only when the typical " boiled sago " sputum was produced could the microscopic findings be predicted with confidence. This type was also very firm and elastic, and a lump of any size usually had to be squeezed out under the cover-slip. The appearances associated with an excess of eosinophils varied widely from the green sputum described by May (1954), through mucopurulent and mucoid, to what seemed only stringy mucus. The " boiled-sago " type, and the eosinophilic green sputum were both rare, and on the whole the commonest was mucoid sputum which was sticky and gelatinous. Residual sputum of this type, associated with bronchospasm and persisting after pus had subsided with the use of antibiotics, was very often eosinophilic.

Screening Technique for Eosinophils

The piece of sputum is placed on a slide. It may be spread out with forceps, but it is not spread into a film because this tends to break up eosinophils and casts. Thin films also give a very much smaller and less representative sample. One drop of Leishman stain is applied with an eyedropper, followed by one drop of distilled water; a cover slip is dropped on top, and the specimen is examined after from ten minutes to several hours. At first only the edges of the specimen are well stained, but later any eosinophils in the centre pick up the stain while the rest of the cells in the interior of the lump are still unstained. It was often possible, when an established case of asthma was seen for the first time, to take the specimen first so that it was ready for examination by the time the clinical assessment was completed. Slides and coverslips can be used straight from the box without cleaning, thus saving valuable time in a busy clinic. An old-fashioned students' microscope was found quite adequate, and all requirements can easily be fitted inside the case in spring clips for domiciliary use. A simple microscope is also much easier to carry about and set up.

This crude method of examination often took about the same time as writing out a form to send the specimen to the laboratory. A similar method has been described by Mulder (1956), but the sputum is washed in buffered saline before staining with eosin. Rawlins (1955) has also shown that examination of thin smears is of little value because of the irregular distribution of these cells. He homogenised the sputum with pancreatin, and carried out total and differential counts, but this would be difficult to do in tiny specimens and has the defect of breaking up any small casts.

Microscopic Appearances

The eosinophilic portions of the specimen can easily be located under the 2/3 in. objective with a no. 3 eyepiece, and the typical coarse eosinophilic granules confirmed by examination with the 1/6 in. objective. It was found that daylight was far better than any other form of illumination, because the eosinophils are much more obvious and the significant portions of the specimen can be located swiftly.

The numbers of eosinophils varied enormously from occasional scattered eosinophil cells to streaks, clumps, casts, or sputum in which there were few other cells. Occasionally they were hard to find, either because the specimen was poor or because they were in isolated clumps and several specimens had to be examined. This applied particularly to cases in which treatment with prednisolone had been dramatically successful before the routine examination of sputum was introduced, and confirmation of their presence or absence was required to complete this survey.

With purulent sputum the eosinophils may be found in clumps, or as occasional tiny casts, and re-examination after antibiotic treatment will show no pus and many eosinophils, which had previously been swamped by pus cells (Helm et al. 1954, Stuart-Harris and Hanley 1957).

Bronchial casts of any size were seen only once, but small eosinophilic casts of the terminal bronchioles were a common finding. Kurschmann's spirals and Charcot-Leyden crystals, which are only signs of the severity and chronicity of the condition, were rare.

Eosinophils were scattered irregularly throughout the sputum, the number undoubtedly varying from day to day, from specimen to specimen, so any attempt to carry out differential counts (Rawlins 1955) seemed pointless; but a rough system of expressing the degree of eosinophilia was used.

Significance of Eosinophils

Once it was realised that excessive numbers of eosinophils meant that treatment with prednisolone would be effective, it seemed likely that steroid therapy could be placed on a much more scientific basis. But it soon became clear that large numbers of eosinophils in the sputum were not necessarily associated with severe asthma or a failure to respond to antispasmodics which justified the use of prednisolone. A boy of eight, with simple recurrent bronchial catarrh and many rhonchi but no definite bronchospasm, had only eosinophil cells in his sputum; and his brother of nine with no signs in his chest at all produced a tiny piece of sputum crowded with eosinophils. Obviously it was unjustifiable to suggest anything more than the simplest remedies. The deciding factor was the severity of the bronchospasm and *not* the findings in the sputum.

Results

The findings summarised in the accompanying table show the striking improvement in the eosinophilic cases and the poor results in other patients. In general, the greater the numbers of eosinophils, the more certain was the result.

90 CASES OF CHRONIC ASTHMA TREATED WITH PREDNISOLONE

Relief of bronchospasm	Cases with eosinophilic sputum	Cases with a few or no eosinophils
Complete	56	1
Partial	7	3
Slight	—	7
No relief	—	16
Total	63	27

Some patients have had to stay on prednisolone for a long time. Which is the lesser evil, disabling asthma or the dangers of long-term prednisolone treatment? All patients who had to make this choice chose to continue treatment in the knowledge that there are certain dangers.

A man of 29 has been taking prednisolone, plus occasional doses of antispasmodics, for three years. Previously he had

been totally incapacitated for four months, in spite of intensive treatment with bronchodilators and a short course of cortisone acetate. The prognosis seemed grave after sixteen years of chronic asthma and after all other drugs had lost their effect. With antibiotics and larger doses of cortisone acetate, which were gradually reduced as his condition improved, he was finally able to return to work. Residual dyspnœa is slight, but radiologically the emphysematous change is severe, and has not altered. He has been taking prednisolone instead of cortisone for the past two years (10–5 mg. daily). He has remained well. Sputum is scanty but always contains many eosinophils. Bronchospasm becomes severe a short time after stopping therapy. As a safeguard, however, he is now having weekly injections of long-acting corticotrophin.

The elderly bronchitic with severe bronchospasm rarely benefited, but there were a few surprise results in patients for whom nothing else seemed possible. Younger patients who obtained complete relief from bronchospasm usually had little or no residual dyspnœa once the bronchospasm had disappeared. On the other hand, the older asthmatics in whom emphysema had developed were still dyspnœic to a varying extent.

Experience showed that if there was no improvement in the course of two weeks on 15 or 20 mg. of prednisolone per day in the absence of purulent sputum, no significant benefit would be derived from continuing treatment. Cases of chronic bronchospasm who fulfilled the criteria for entry to the trial, but who had negative sputum findings, were, therefore, admitted to the trial for a short course only, followed by tapering off before they could become dependent on the hormone. As a result sufficient cases have been included to make it clear that in the absence of excess of eosinophils seldom can even partial relief be expected.

Results in Children

In children only the very worst cases were treated, and then only after the demonstration of eosinophils in the sputum had put therapy on a sounder basis. It was decided that it was quite unjustifiable to use prednisolone unless antispasmodics were of no avail and there was definite evidence of emphysema and a poor prognosis. So far there has been no occasion to regret this decision, and the most dramatic results have been in children and young people. It must be emphasised that prednisolone was not considered unless the child had constant bronchospasm punctuated by exacerbations. The results in children reported by Kennedy and Thursby-Pelham (1956) and Thursby-Pelham and Kennedy (1958) were encouraging, but the doses may have been on the high side, especially for long-term therapy.

Excess of eosinophils in the sputum and nasal smears has been a relatively common finding in children. The usual history was of frequent respiratory infections but no obvious asthmatic symptoms beyond occasional wheezing. Sometimes, however, the history suggests bronchiectasis, and can be most misleading. My observations so far suggest that recurrent bronchitis or frequent colds in children should be suspected of having an allergic basis, and that sputum examination may often give a true diagnosis.

Complications

The most serious complication was glycosuria, of which there were 3 instances, 1 in a mild diabetic.

Treatment with prednisolone definitely appeared to make attacks of purulent bronchitis more common in 3 patients. Purulent sputum had been a prominent feature for years, and it was decided that prednisolone should be stopped because of the risks involved with the persistence of chronic infection.

Defects of the Trial

This trial is open to much criticism because the patients all knew the nature of the treatment and some of its dangers, and even regulated their own dosage. Moreover, the doctor-patient relationship was very strong. The only objective findings were in the sputum and the correlation of the sputum results with those of treatment. Attempts were made to introduce placebo tablets to patients who were apparently having homœopathic doses, but this could not reasonably be done in those who were taking a greater quantity because of the known dangers of sudden cessation of treatment, firstly because they regulated their own dosage, and secondly because they could have an acute attack requiring an increased dose. It was also very difficult to ensure that the family doctor was fully aware that placebo was being given, because his partners might not know, and endless difficulties could arise in the event of an acute attack. In 3 cases it was shown that placebos were not a substitute for 2·5 or 1·25 mg. per day.

The unpredictable results of steroid therapy in asthma which have bedevilled other trials, and the difficulties in diagnosis between bronchitis and asthma, seem from these data to be due to an unknown degree of dilution of the test sample with bronchitics. The assessments were not based on scientific evidence, and clinical assessment in emphysema has been shown by Fletcher (1952) to vary widely from observer to observer. Also subjective evidence in asthmatic patients is notoriously subject to psychosomatic influences. It is, however, difficult to credit that the data given here can be entirely erroneous. At least the trial sample of true allergic asthmatics has been purified, and it is well established that the steroids will suppress allergic phenomena.

Summary

90 patients with chronic asthma were treated with prednisolone. Only those in whom bronchodilator drugs had failed to produce a satisfactory response were included.

The results indicate that prednisolone is very useful in the treatment of chronic asthma *provided* the sputum contains large numbers of eosinophils. In the absence of an eosinophilic sputum a satisfactory response is unlikely, and the use of prednisolone is contraindicated.

A method of self-regulated dosage ensured that only the smallest possible effective dose was taken so that side-effects and complications were less likely.

Though prednisolone is an effective treatment in suitable cases it never does more than suppress the asthmatic state and it does not abolish eosinophils in the sputum, though the quantity is much reduced.

I wish to thank Dr. E. V. Morton, of Boots Pure Drug Co., for a most generous supply of prednisolone, Mr. E. Roe, laboratory technician, Derwent Hospital, Derby, for his assistance, and general practitioners in the area whose support made this trial possible.

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HYDROCORTISONE HEMISUCCINATE BY INHALATION IN CHILDREN WITH ASTHMA

J. MORRISON SMITH
M.B. Glasg., M.R.C.P.E., D.P.H., D.M.T. & H., T.D.D.
CONSULTANT CHEST PHYSICIAN, BIRMINGHAM
From the Asthma Clinic, Birmingham School Health Service

LOCAL steroid therapy has been widely used with success in ophthalmology and dermatology. Herxheimer and McAllen (1956) claimed very good results in hay-fever by using hydrocortisone snuff. Although their paper was criticised by the *British Medical Journal* (1956), it did seem that the local application of hydrocortisone in allergic conditions might be extended to the respiratory tract. More recently Morris-Owen and Truelove (1958) have now reported some success with hydrocortisone-hemisuccinate solution in hayfever; and Brockbank and Pengelly (1958) reported some good results with hydrocortisone-acetate powder inhaled by patients with asthma.

The trial recorded here was planned to show whether useful relief could be obtained by the local effect on the bronchial mucosa of a solution of hydrocortisone hemi-succinate given by inhalation. It was considered that in order to be of real value this treatment must be shown to be beneficial to at least 50% more children than might benefit from the inhalation of an inert solution.

TABLE I—AGE OF PATIENTS AND DURATION OF ILLNESS

Age (years)	Group A	Group B	Duration (years)	Group A	Group B
5–6	1	0	1	0	1
6–7	1	2	2	1	1
7–8	4	4	3	2	0
8–9	1	6	4	5	3
9–10	2	3	5	3	1
10–11	4	0	6	3	5
11–12	2	4	7	4	3
12–13	3	1	8	4	4
13–14	2	5	9	0	2
14–15	5	3	10	2	2
15–16	3	1	11	0	3
..	..	..	12	3	0
..	..	..	13	1	2
..	..	..	14	0	2
Total	28	29	Total	28	29

The Trial

Selection of Patients

The children were all patients who had been attending the asthma clinic of the Birmingham School Health Service for periods of from two months to four years and had been fully investigated. They were divided into two groups according to a list based upon random numbers, and these groups were reasonably similar.

Table I shows age-distribution and duration of asthma; table II the sex-distribution, the occurrence of eczema together with asthma, and the severity of the asthma; and table III the relevant allergic factors, judging from the history and clinical investigation. The severity was estimated in relation to the amount of incapacity; the severe cases were seldom able to attend ordinary schools, the moderate cases lost time from school during acute attacks only, and the mild cases were seldom away from school because of asthma, even if it was present at some time on most days.

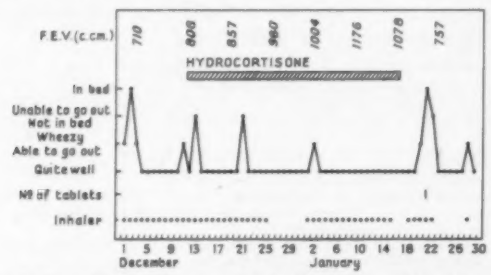

Fig. 1—Boy of 6 years in group B, who had hydrocortisone. Interpreted as success. In figs. 1-4, supplementary treatment is shown as tablets (ephedrine, &c.), inhaler (adrenaline, &c.), or medicines. F.E.V. — forced expiratory volume.

Procedure

The hydrocortisone-hemisuccinate sodium was supplied to the patients weekly in solution in small dark-glass bottles. Each bottle had a calibrated dropper which delivered 5 mg. as the daily dose in a suitable small quantity of fluid for use in the inhaler. An apparently identical placebo was supplied in similar bottles. The placebo was labelled A and the hydrocortisone B. Neither the patients nor the medical or nursing staff of the clinic were aware of the identity of the solutions until after the trial was completed. The whole dose had to be inhaled each day for a month. Treatment was carefully supervised by the clinic nurses and school health visitors. No other new treatment was begun during the period of the trial.

TABLE II—SEX-DISTRIBUTION, INCIDENCE OF ECZEMA PLUS ASTHMA, AND SEVERITY OF ASTHMA

Patients	Group A	Group B	Total
Boys	23	26	49
Girls	5	3	8
With eczema	12	10	22
No eczema	16	19	35
Severe asthma	6	11	17
Moderate asthma ..	15	13	28
Mild asthma	7	5	12

Assessment

The trial was planned so that statistical assessment would be made by sequential analysis (Armitage 1954).

TABLE III—ALLERGIC FACTORS

Allergic factor	Group A	Group B	Total
Household dust	20	14	34
Pollen + household dust ..	6	11	17
Moulds + household dust ..	1	2	3
No allergic factors	1	2	3
Total	28	29	57

The effect of treatment in each case was judged as "success" or "failure", using two methods of assessment. The first was a daily symptom record card kept by the mother. These cards were not specially prepared for this trial but had been in general use in the clinic for two years. The second was by measuring the volume of air expired in the first 0·75 sec. of a fast expiration. This test was performed weekly and the best result of six attempts was recorded on each occasion.

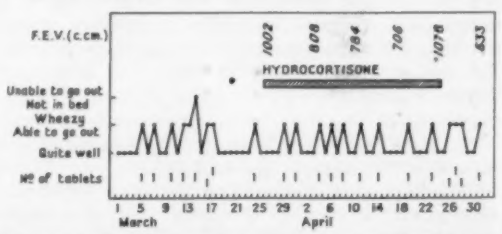

Fig. 2—Boy of 10 years in group B, who had hydrocortisone. Interpreted as failure.

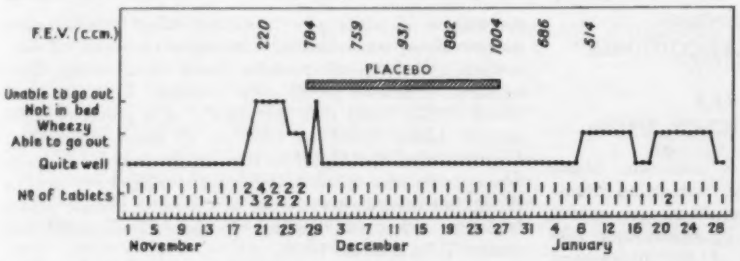

Fig. 3—Boy of 7 years in group A, who had placebo. The result was interpreted as success.

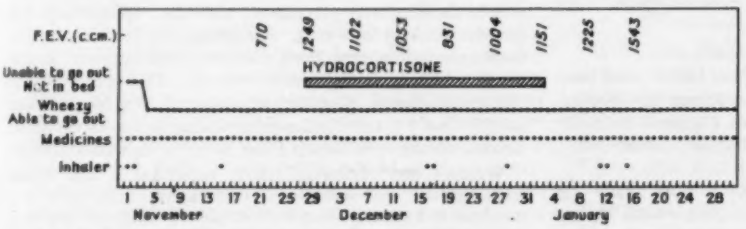

Fig. 4—Girl of 7 years in group B, who had hydrocortisone. Interpreted as failure.

The fast expiratory volume (F.E.V.) is a satisfactory measure of respiratory function in such studies as this (Thomson and Hugh-Jones 1958, *Lancet* 1957) and is even simpler than the expiratory flow rate (E.F.R.) described by Kennedy (1953) and used by Kennedy and Thursby Pelham (1956, 1958) in studies of the systemic effect of steroid therapy in children with asthma.

Figs. 1–4 illustrate the records obtained. Provided that the symptom record showed some sustained improvement during the period of treatment, even if slight, and this was confirmed by a sustained improvement in the respiratory-function figures, a success was recorded. Success or failure was entered for each case on a card which was passed to a colleague, who entered the results on a statistical diagram which had been prepared in advance, and which was held confidentially by that colleague.

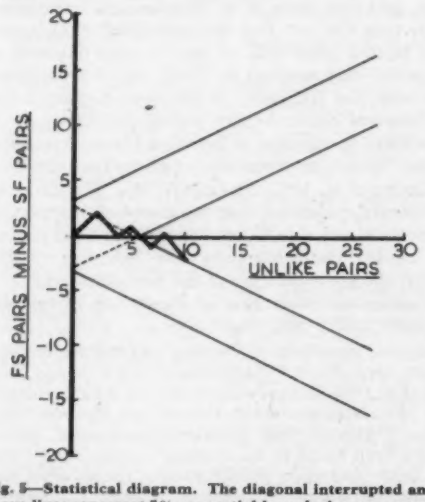

Fig. 5—Statistical diagram. The diagonal interrupted and continuous lines represent 5% sequential boundaries corresponding to an expected success-rate at 65% with treated series and 15% with control.

Results

Table IV shows the results in plain figures. The placebo showed benefit to 14% and the hydrocortisone to 21% of the children treated.

Fig. 5 shows the statistical diagram (the original was on squared paper).

The cases in the trial were paired, one on each treatment, as the results were obtained. Where the results (success or failure) were the same in both members of a pair, nothing was entered on the diagram, but where the results were different, the centre line on the diagram was advanced by one square diagonally in either a N.E. or S.E. direction according to whether the results favoured treatment B or treatment A. Success according to the criteria agreed in advance would have been achieved for treatment B if the centre line had crossed the upper diagonal line, or for treatment A if it had crossed the lower diagonal line.

In fact it did neither and when it entered the central area it was established that the difference, if any, between the results of treatments A and B did not reach the level on which the trial was based. This was, as stated, that 50% more children should show benefit from the hydrocortisone than did so from

TABLE IV—RESULTS OF CONTROL AND HYDROCORTISONE TREATMENT

Treatment	Success	Failure	Total
A (control)	4	24	28
B (hydrocortisone)	6	23	29
Totals	10	47	57

the placebo. It was estimated that 15% would be likely to benefit from the placebo, so that the hydrocortisone had to benefit 65% or more to satisfy the criteria. This it failed to do. The trial was, however, continued for a while after the central area had been reached, to see if any evidence of a lesser benefit from hydrocortisone accrued.

The two treatments gave similar results over the whole period of the investigation.

Summary and Conclusion

A controlled trial was conducted of hydrocortisone-hemisuccinate solution (5 mg. daily by inhalation for a month) in children with asthma. The treatment failed to benefit 50% more children than did a placebo; over the whole period of the investigation the hydrocortisone benefited 21% of 29 children and the placebo 14% of 28 children.

A real need exists for trials to assess the value of treatments in asthma. The trials should give reliable results both statistically and clinically. It is hoped that the pattern evolved in this trial may prove suitable for further studies in asthma.

I wish to express my thanks to Dr. Ian Sutherland, of the Medical Research Council's statistical research unit, and Dr. V. H. Springett for essential help and criticism, particularly with the statistical work. I am also grateful to Glaxo Laboratories Ltd., who supplied the hydrocortisone preparation and helped to support the work financially, and to the nursing staff of the Asthma Clinic, Miss C. Butt and Mrs. G. Roberts-Jones.

References overleaf

THE RELATION BETWEEN REGIONAL ILEITIS AND SARCOIDOSIS *

D. N. PHEAR
M.A., M.D. Cantab., M.R.C.P.
SENIOR MEDICAL REGISTRAR, CENTRAL MIDDLESEX HOSPITAL, LONDON, N.W.10

THE ætiology of regional ileitis is unknown. Many attempts to isolate causative bacteria have failed (Pumphrey 1938), and suggested causes include viruses, animal parasites, foreign bodies, vascular or neurotropic disturbances, and allergy. Because of the histological similarity between regional ileitis and sarcoidosis a group of patients with regional ileitis have been investigated for evidence of sarcoidosis.

Material and Method

25 women and 15 men with regional ileitis have been studied. Their ages varied from seventeen to seventy-eight years. Since acute and chronic regional ileitis are thought to be stages of the same disease (Crohn 1949), cases of both were included.

History and examination.—A search was made for clinical evidence of generalised sarcoidosis—such as skin lesions, iridocyclitis, parotid swelling, and enlargement of glands or spleen—but none was found.

Mantoux reaction.—Of 35 patients tested 24 (71%) gave no reaction with 10 units Old Tuberculin. 9 of these non-reactors were tested again with 100 units; and 4 gave a positive reaction.

Radiographs.—The chest film was normal in all patients. Radiographs of fingers and toes were not taken because these very seldom supply more information than does the overlying skin (James 1956).

Serum-proteins.—The γ-globulins were raised in 3 patients, of whom 1 had extensive amyloidosis. Of these 3, 1 had raised α_2-globulin levels, and so did 2 other patients. James (1956) found increased α_2-globulins or γ-globulins, or both, in 14 of 50 patients with sarcoidosis.

Leucocyte-count.—3 patients, all with acute ileitis, had leucocytosis. None showed eosinophilia or the monocytosis frequently seen in sarcoidosis (Thomas 1943).

The *sedimentation-rate* was raised in 16 patients, of whom 6 showed no clinical evidence of active disease.

Discussion

The only report of a similar investigation is that of Blackburn et al. (1939). They found no evidence of sarcoidosis in the clinical histories or examination of their 22 cases. Radiographs of fingers and toes were available in 16; but, apart from a single punched-out area in one digit, they were entirely normal. Chest radiographs, available in 18, were also normal. Of 17 patients tested with 1 unit Old Tuberculin 12 failed to react; but 4 out of 8 non-reactors gave a positive reaction with 10 units. In the present series 24 (71%) of 35 patients tested gave no reaction to 10 units tuberculin, but other resemblances to sarcoidosis were lacking. In reported series of sarcoidosis 60–70% of patients have been tuberculin-negative (Freiman 1948). By contrast, Giannini and Sloan (1957) found that only 14·6% of a group of 1285 normal adults failed to react to 10 units tuberculin. Depression of the Mantoux reaction in sarcoidosis may, however, be non-specific; there is a similar depression in Hodgkin's disease, berylliosis, or any other disease which leads to widespread damage to the reticuloendothelial system (Hoyle et al. 1954).

There are other immunological similarities. Wells and Wylie (1949) found Old Tuberculin to be neutralised by the sera of patients with sarcoidosis and other epithelioid-cell diseases such as kala-azar. A neutralising factor was also demonstrated in sera from patients with regional ileitis but not in sera from normal controls. The specificity of this phenomenon is, however, doubtful, for Magnusson (1956) found a tuberculin-neutralising factor as often in normal serum as in serum from patients with sarcoidiosis.

Williams and Nickerson (1935) emulsified a skin lesion from a patient with sarcoidosis. Intradermal injections of this emulsion in 2 other patients with sarcoidosis and 2 with regional ileitis gave positive reactions. There was no reaction in 4 normal controls. On the other hand, Kveim's emulsion of a sarcoid lymph-node gave no reaction in 10 patients with regional ileitis (James 1958), while the test was positive in 75% of sarcoid patients.

Many workers consider regional ileitis and sarcoidosis morphologically indistinguishable (Homans and Hass 1933, Deelman 1935, Snapper 1938, Hadfield 1939, Koenig 1945, Watson et al. 1945). Hadfield (1939) described the early and possibly specific lesion of regional ileitis. There is lymphadenoid hyperplasia in the submucosa, leading to the formation of non-caseating giant-cell systems. Acid-fast bacilli are never found. The lesion regresses without scarring, as does sarcoidosis. This appearance is also found in the regional lymph-nodes and may here persist when the primary lesion in the intestinal wall has been obliterated by the results of secondary infection and lymphatic obstruction.

Warren and Sommers (1948), on the other hand, stated that in sarcoidosis the granulomata are larger and more numerous, and that there is no lymphocytic infiltration. Moreover, they did not find the spiculated Schaumann bodies of sarcoid giant-cells in any of their 61 cases of regional ileitis. Rappaport et al. (1951) found Schaumann bodies in only 3 of 100 cases. It has been suggested that the giant-cells of regional ileitis are of the foreign-body type, appearing in response to vegetable fibres, crystals of talc, dietary lipoids, or parasites carried by the lymphatic vessels (Crohn et al. 1932, Snapper 1938). Watson et al. (1945), however, point out that the giant-cell reaction, of some patients at any rate, is too extensive to be explained on this basis. These workers, like Schepers (1945), believe that the giant-cells are of the Langhans type.

The anatomical distribution of the lesions of regional ileitis is quite unlike that of sarcoidosis.

In generalised sarcoidosis only 9 cases with definite intestinal lesions have been reported (Moschcowitz and Wilensky 1923, Bernstein et al. 1929, Lenartowicz and Rothfeld 1930, Homans and Hass 1933, Bergmann 1938, Cotter 1939, Neubert 1946). In another 3 patients with generalised sarcoidosis, sarcoid lesions have been found in the stomach (Lorber et al. 1954). Regional ileitis, moreover, seldom involves tissues other than the intestinal wall and the regional lymph-nodes. Chapin et al. (1956) found sarcoid lesions at necropsy in the liver of only 1 of 39 cases of regional ileitis. Small healed lesions in the liver

* Based on work awarded the Central Middlesex Hospital research prize for 1958.

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were found in 3 other cases. 1 had granulomatous lesions with central caseation in the lungs, but no acid-fast bacilli were seen. No granulomata were found in other organs. Comfort et al. (1950) reported a case showing widespread sarcoid lesions in the stomach and small intestine, with involvement of the mesenteric nodes, the periadrenal connective tissue, and the liver.

Bockus et al. (1940) described a boy with regional ileitis who had tubercle bacilli in the fæces on three occasions early in the disease. While this is extremely rare (Crohn 1949), tubercle bacilli are found in up to 25% of patients with pulmonary sarcoidosis at some stage in the disease (*British Medical Journal* 1956). In the United States, too, sarcoidosis is unduly common in Negroes, whereas regional ileitis is rare.

Treatment with cortisone—either alone or in combination with antituberculous drugs—has proved effective in sarcoidosis. The possible relation between regional ileitis and sarcoidosis has therefore led to the trial of cortisone in regional ileitis. Good results have been reported by several workers (Machella and Hollan 1951, Stanley et al. 1951, Cooke 1955), but Sauer et al. (1952) found hormones ineffective. The results of surgery are appalling, with recurrence-rates of 45% at two years and 78% at ten years (Cooke 1955). If the sarcoid hypothesis leads to more success in treatment, it will be fully justified.

Summary

40 patients with regional ileitis have been investigated for evidence of generalised sarcoidosis. In only 11 (29%) of 35 patients tested was there a positive reaction to 10 units Old Tuberculin. No other similarities to sarcoidiosis were found.

The relation between sarcoidosis and regional ileitis suggested by some workers is discussed.

I am very grateful to the physicians and surgeons of the Central Middlesex Hospital, London, and Addenbrooke's Hospital, Cambridge, and especially to Dr. F. Avery Jones and Dr. T. D. Kellock, for permission to study their patients.

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GANGLION-BLOCKING AGENTS IN MITRAL-VALVE DISEASE

J. F. GOODWIN
M.D. Lond., F.R.C.P.
PHYSICIAN, HAMMERSMITH HOSPITAL; LECTURER IN MEDICINE, POSTGRADUATE MEDICAL SCHOOL, LONDON, W.12

ARTHUR HOLLMAN
M.D. Lond., M.R.C.P.
SENIOR MEDICAL REGISTRAR AND MEDICAL TUTOR, POSTGRADUATE MEDICAL SCHOOL, LONDON

T. V. O'DONNELL
M.B. N.Z., M.R.C.P., M.R.A.C.P.
LATELY SENIOR HOUSE-OFFICER, DEPARTMENT OF MEDICINE, POSTGRADUATE MEDICAL SCHOOL, LONDON *

THE influence of hexamethonium bromide upon cardiac output and the pulmonary circulation has been studied by Gilmore et al. (1952). This and other ganglion-blocking agents have been used to study the lesser circulation in mitral stenosis (Halmágyi et al. 1953, Wilson and Keeley 1953, Davies et al. 1954, Judson et al. 1954, Storstein and Tveten 1954, Scott et al. 1955, Wade et al. 1956, Balchum et al. 1957, Yu et al. 1957). The results have been variable, and widely differing conclusions have been drawn.

This paper reports the findings in 32 observations on 30 patients with mitral-valve disease studied acutely with hexamethonium during cardiac catheterisation. The results have been assembled with those of other workers, in an attempt to analyse the complex effects of this drug on the circulation in mitral-valve disease, and further elucidate the problem of nervous control of vascular tone in the lungs.

Case-material

The 30 cases to be reported include 12 previously reported by one of us (Davies et al. 1954). This is the largest series published. All patients had mitral-valve disease, which was purely obstructive in all except 4 who had appreciable mitral incompetence. Aortic valvular disease was considerable in 2 and 2 had systemic blood-pressures of 190/90 mm. Hg and 170/80 mm. Hg. Thus 8 patients had important cardiovascular lesions other than pure mitral stenosis. There was no evidence of congestive cardiac failure in any patient at the time of study.

Methods

All patients were undergoing cardiac catheterisation for assessment of suitability for mitral valvotomy. They were studied in the recumbent position under sedation. Cardiac output, systemic blood-pressure (by sphygmomanometer), and pulmonary-artery pressure were recorded before and after the injection of the calculated dose of hexamethonium through the catheter, according to the technique already described (Davies et al. 1954), except that oxygen consumption was measured with the spirometer rather than the Douglas bag.

Small doses of hexamethonium (10-20 mg.) were used, as in the previous study.

In 14 patients the pulmonary-wedge pressure (pulmonary capillary venous pressure) as well as pulmonary-artery pressure was recorded before and at short intervals for up to 15 minutes after the administration of hexamethonium bromide. The cardiac output was measured before and 5-15 minutes after the drug was given.

The arterial oxygen saturation was measured by ear oximeter before and after. As before, all pressures were measured from a point 5 cm. below the sternal angle.

Analysis of Personal and Published Data

In order to evaluate fully the combined results published by other workers we abstracted their data and analysed them along

* Now senior registrar, cardiac department, Middlesex Hospital, London, W.1.

with our own. Detailed data on the effect of ganglion-blocking agents on the pulmonary-artery pressure are available in 43 patients studied by different workers (Halmágyi et al. 1953, Wilson and Keeley 1953, Storstein and Tveten 1954, Scott et al. 1955, Wade et al. 1956, Balchum et al. 1957). Together with our own material, there is a total of 75 observations studied. In the majority of cases hexamethonium was used, but Scott et al. (1955) used tetraethylammonium chloride, and Halmágyi et al. (1953) tetraethylammonium bromide. We have, however, assumed that the circulatory action of these drugs is similar to that of hexamethonium. We have arbitrarily considered changes in pressure or flow of less than 10% as insignificant.

The total material has been assessed according to the various measurements carried out:

	Pulmonary-artery pressure	*Cardiac output*	*"Wedge" pulmonary capillary venous pressure*
Personal cases ..	31	28	14
Reported cases ..	43	32	23
Total ..	74	60	37

Data on pulmonary-artery pressure, cardiac output, and pulmonary capillary venous pressure are available in 33 individual observations (23 from the literature and 10 of our own). Pulmonary arteriolar resistance could be calculated in the same subject before and after the drug, from these data.

TABLE I—THE EFFECTS OF GANGLION-BLOCKING AGENTS IN MITRAL DISEASE

—	Fell 10% or more		Rose 10% or more		Unchanged		Total patients
	Personal series	Reported series	Personal series	Reported series	Personal series	Reported series	
Cardiac output	9	19	9	7	10	8	62
Pulmonary-artery pressure	20	31	2	1	9	7	70
Pulmonary capillary venous pressure	10	14	0	3	4	6	37

Data on cardiac output and pulmonary-artery pressure in the same subject before and after the drug are available in 60 observations (26 of our own and 34 from the literature).

Results

Our results are summarised in table I,† which also shows in summary the grouped results in other reported series.

EFFECT ON CARDIAC OUTPUT AND SYSTOLIC PULMONARY-ARTERY PRESSURE

In 20 of 31 of our own observations the pulmonary-artery systolic pressure fell; it was unchanged in 9, and rose in 2.

In the reported series (excluding the cases of Halmágyi et al. [1953] in which only mean data are given) the pulmonary-artery pressure fell in 31, was unchanged in 7 and rose in 1.

The effect on cardiac output was more variable than that on pulmonary-artery pressure. In our own series the output fell in 9 patients, rose in 9, and remained unchanged in 10.

In the combined reported series the output fell in 19, was unchanged in 8, and rose in 7.

Few deductions can be drawn from the action of ganglion-blocking drugs on either cardiac output or pulmonary-artery pressure alone; simultaneous measurements of both being of much greater significance.

The relationship between change in cardiac output and pulmonary-artery pressure in 26 of our own cases and 34 reported cases is shown in fig. 1. 10 of our patients showed a fall in pulmonary-artery pressure, with either no change or an increase in output (fig. 2). In 7 patients an appreciable fall in pulmonary-artery pressure was accompanied by a fall in cardiac output. Of 5 patients in whom the pulmonary-artery pressure was unchanged, the output fell in 2, was unchanged in 2, and rose in 1. In 2 patients the pulmonary-artery pressure fell but the output was unchanged, while in 2 patients both the cardiac output and the pulmonary-artery pressure rose.

† A table showing the full results may be had from the editorial office of *The Lancet*, 7, Adam Street, London, W.C.2.

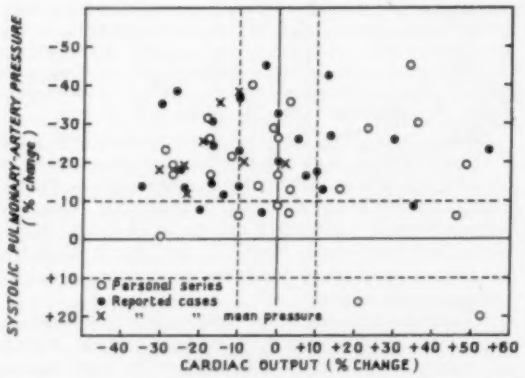

Fig. 1—The effect of hexamethonium on pulmonary-artery pressure and cardiac output in 60 cases of mitral stenosis.

Of the reported cases 10 had a fall in pulmonary-artery pressure with either a rise or no change in cardiac output, while in 18 the fall in pulmonary-artery pressure was accompanied by a fall in cardiac output. In 2 patients the pulmonary-artery pressure fell without change in cardiac output. Of 3 patients in whom there was no fall in pulmonary-artery pressure, the output rose in 1, fell in 1, and was unchanged in 1.

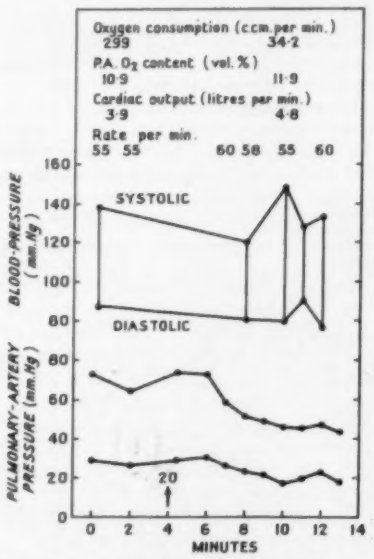

Fig. 2—The hæmodynamic effects of hexamethonium in a patient with mitral stenosis.

The figure 20 above the arrow at 4 minutes denotes the dose of hexamethonium (mg.) given through the cardiac catheter placed in the pulmonary artery.

The pulmonary-artery pressure falls, the cardiac output rises, and pulse-rate is not significantly changed. There is a slight fall in systemic blood-pressure, followed by a transitory rise, at the time of maximum fall in pulmonary-artery pressure. (See text.)

There is a total of 33 observations on the effect of ganglion-blocking drugs on pulmonary-artery pressure, pulmonary capillary venous pressure, and cardiac output in the same subjects. These will now be considered, the further analysis of the results being assessed in the light of changes in cardiac output. We realise that changes in cardiac output do not necessarily represent the initial effect of ganglion-blocking agents on the circulation, but this measurement

TABLE II—CHANGE IN PULMONARY ARTERIOLAR RESISTANCE FOLLOWING HEXAMETHONIUM (PERSONAL SERIES)

Case	Percentage change in			
	Cardiac output	Pulmonary-artery pressure	Pulmonary capillary pressure (wedged)	Pulmonary arteriolar resistance
A	+20	+16	−22	+97
B	+53	+15	−20	+50
C	−27	−10	−13	+45
D	−27	−17	−45	+40
E	− 5	− 3	0	− 4
F	0	−17	−20	− 5
G	−10	− 9	−10	−10
H	−17	−18	0	−29
I	− 7	−33	−28	−31
J	+46	− 8	− 6	−44

provides a convenient background against which to study the other more complex changes induced by these drugs.

CHANGES IN MEAN PULMONARY-ARTERY PRESSURE AND MEAN PULMONARY CAPILLARY VENOUS PRESSURE (TABLE II, FIG. 3)

Patients in Whom Cardiac Output Rose

There were 3 such cases in our own series, and 5 in the reported series. The pulmonary capillary venous pressure fell in all our cases, but in 1 the fall was trivial. In 2 cases the mean pulmonary artery pressure rose slightly, and in 1 case it fell slightly.

In the reported series the mean pulmonary-artery pressure fell considerably in all. The pulmonary capillary venous pressure rose in 3, was unchanged in 1, and fell in 1.

The increase in cardiac output suggests a release of pulmonary vascular hindrance, but might also be due to relief of occult left ventricular failure. The presence of possible causes for such failure is not mentioned in the published cases, but in our own 3 subjects with this response, pure mitral stenosis (proved at valvotomy) was the only lesion, and no obvious cause for left ventricular failure was present. The heart-rate rose in 2 patients, fell in 1, was unchanged in 1, and was not recorded in 4. In 2 of our cases the calculated pulmonary arteriolar resistance actually increased as a result of a rise in pulmonary-artery pressure and fall in pulmonary capillary venous pressure. There was an increase in pulmonary-artery/pulmonary-capillary pressure gradient which was proportionately greater than the increase in output. In the only case in this group of the reported series in which pulmonary capillary venous pressure fell, the calculated arteriolar resistance also fell.

The systemic resistance fell in all but 1 case, in which it rose. The total pulmonary resistance fell in all but 1 case, in which it was unchanged, and the pulmonary arteriolar resistance fell in all but 2 (our own cases).

If the results are analysed from the viewpoint of a change in pulmonary resistance rather than in cardiac output, the 10 cases reported by Wade et al. (1956), in which cardiac output is not given, may be included. Of the total of 45 cases in which it was measured, pulmonary arteriolar or total pulmonary resistance fell in 24, rose in 10, and was unchanged in 11.

Of special interest and importance are the 3 cases of other workers showing a rise in cardiac output, fall in pulmonary-artery pressure, and rise in pulmonary capillary venous pressure. These are analysed in table III. The effects of hexamethonium in these cases can only be interpreted as a release of pulmonary-arteriolar constriction, resulting in an increase in cardiac output, and therefore a rise in pulmonary capillary venous pressure.

TABLE III—CASES SHOWING CLEAR EVIDENCE OF PULMONARY VASODILATATION FOLLOWING HEXAMETHONIUM

Author	Mean pulmonary artery pressure (mm. Hg)		Mean pulmonary capillary pressure (mm. Hg)		Cardiac output (litres per min.)		Pulmonary arteriolar resistance (units)	
	Before	After	Before	After	Before	After	Before	After
Balchum et al. (1957), case 9	33	30	22	25	2·0	2·7	3·3	1·1
Balchum et al. (1957), case 13	29	22	18	20	1·8	2·7	2·9	0·2
Scott et al. (1955), case 5	65	47	26	29	3·6	4·1	10·8	4·4

Patients in Whom Cardiac Output was Unchanged

There were 3 such patients in the personal series and 6 in the reported series. Of the former, all 3 showed a fall in mean pulmonary-artery pressure, and a fall in mean pulmonary capillary venous pressure also. In 2 patients the falls in pulmonary-artery pressure and pulmonary capillary venous pressure were trivial.

In the reported series, of 6 cases 5 showed an appreciable fall in mean pulmonary-artery pressure, and 1 showed a rise. The mean pulmonary capillary venous pressure fell in all.

In these cases the fall in vascular pressures without a fall in output suggests pulmonary vasodilatation or could be accounted for by a shunt of blood from the pulmonary to the systemic vascular bed.

Patients in Whom Cardiac Output Fell

There were 4 such patients in the personal series, and 12 in the reported series. In all except 1 case, the mean pulmonary capillary venous pressure and mean pulmonary-artery pressure also fell.

We do not consider that any definite deductions on the effect of hexamethonium upon the pulmonary vascular system can be drawn when a fall in pressure is accompanied by a fall in output.

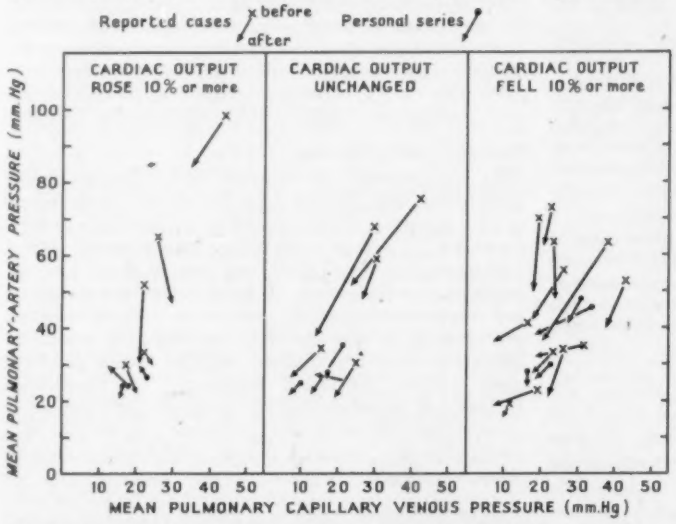

Fig 3.—Mean pulmonary-artery pressure plotted against mean pulmonary capillary venous pressure before and after hexamethonium in 33 patients with mitral-valve disease, arranged in three groups according to the behaviour of the cardiac output.

RELATION OF FALL OF PULMONARY-ARTERY PRESSURE TO INITIAL PULMONARY-ARTERY PRESSURE

In our original series (Davies et al. 1954) we pointed out that the systolic pulmonary-artery pressure fell in proportion to its initial height. This is borne out by the present series ($r = +0{\cdot}875$, $P = 0{\cdot}001$) (fig. 4).

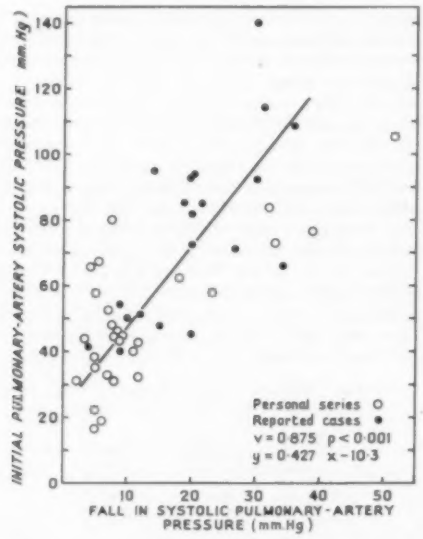

Fig. 4—The fall in systolic pulmonary-artery pressure plotted against the original pressure in patients with mitral-valve disease after hexamethonium showing that the fall in pressure is related to the initial pressure.

VARIATION IN DOSAGE

In the reported series the patients received widely varying doses of hexamethonium, in many cases sufficient to cause a considerable fall in systemic pressure in recumbency. Undoubtedly the variability of many of the results is referable to these dosage differences.

COMPARISON BETWEEN CHANGES IN PULMONARY RESISTANCE AND SYSTEMIC RESISTANCE

A greater fall in total pulmonary resistance than in systemic resistance was found in 1, and a greater fall of pulmonary arteriolar resistance than systemic resistance in 3, of our 9 cases. In 1 case both total pulmonary resistance and pulmonary arteriolar resistance fell equally, and more than systemic resistance, and in another pulmonary arteriolar resistance fell more than both total pulmonary resistance and systemic resistance, suggesting a primary effect upon the pulmonary vessels.

There was no significant difference in response in the 8 cases in our series in which a lesion involving the left ventricle might have caused left-ventricular insufficiency, compared with the response found in pure mitral stenosis. There is thus no positive evidence to suggest that relief of left ventricular failure played any part in any of the vascular responses following hexamethonium.

RELATIVE DECREASES IN SYSTOLIC AND DIASTOLIC PULMONARY ARTERIAL PRESSURES

In both the reported cases and our own series it was apparent that, when the pulmonary-artery pressure fell, the systolic fall was greater than the diastolic, as it was in our initial series (Davies et al. 1954).

Discussion

It is clear that the effects of hexamethonium and similar drugs upon the circulation in mitral disease are complex and often unpredictable, several different responses being obtained with similar doses and under similar conditions.

Cardiac Output

We believe that the most important effect is on cardiac output. The fall which often occurs with large doses is likely to be due to reduced venous return consequent upon systemic venous pooling which accompanies a considerable fall in systemic blood-pressure, and systemic vasodilatation. Under these circumstances the pulmonary-artery pressure falls passively as a result of the systemic change, so that no deductions can be drawn regarding any possible primary effect of hexamethonium on the pulmonary circulation. In a study of 14 patients with various forms of cardiac lesion in whom these effects were noted, Storstein and Tveten (1954) considered that hexamethonium had no selective vasodilator action upon the pulmonary arteries. This reduction in cardiac output has also been reported in patients with arterial hypertension in whom a sharp reduction in systemic blood-pressure was obtained, when the same explanation was advanced (Frisk et al. 1948, Werkö et al. 1951).

The increase in output in some cases after methonium compounds is of great interest. This might be due to an increase in heart-rate, to relief of occult left-ventricular failure with improved left-ventricular stroke volume, or to release of pulmonary vasoconstriction leading to increased right-ventricular stroke volume.

An increase in heart-rate may certainly account in part for the increase in output, as shown by Balchum et al. (1957). However, the output may rise without increase in rate, and then other explanations must be sought. Relief of left-ventricular failure does not provide an adequate reason in patients with pure mitral obstruction and therefore presumably normal left-ventricular function.

It seems probable, therefore, that an increase in output results mainly from an increase in right-ventricular stroke volume following a reduction in pulmonary vascular resistance. This hypothesis is strengthened by the finding in some cases of an accompanying fall in pulmonary-artery pressure (fig. 1). Thus in the presence of organic obstruction to left-ventricular inflow, a fall in output and in pulmonary-artery pressure would suggest a transfer of blood from the pulmonary to the systemic circulation, due to peripheral pooling, while a rise in output with a fall in pressure would indicate a release of pulmonary vascular constriction.

But if, as in left-ventricular failure, the left-ventricular filling pressure is raised, without obstruction to inflow, then a rise in output and fall in pulmonary-artery pressure should be the result of displacement of blood from the pulmonary to the systemic circulation (Werkö et al. 1951, Sarnoff and Berglund 1952, Sarnoff et al. 1953).

Pulmonary-artery Pressure

In the majority of subjects the pulmonary-artery pressure fell, and in many cases this was clearly the result of a fall in output, the reasons for which have already been discussed. A fall in pulmonary-artery pressure with a rise in output suggests, as has already been stressed, pulmonary vasodilatation. It is clear that no conclusions can be drawn from the changes in pulmonary-artery pressure unless considered in the light of associated changes in output, pulmonary capillary venous pressure, and, possibly, calculated resistance. A paradoxical increase in pulmonary-artery pressure occurred in 3 cases in the combined series; but this was, at least in 2 cases, probably due to a rise in output rather than to vasoconstriction.

Pulmonary Capillary Venous Pressure

This was unchanged or fell in all our own cases, and in the majority of the reported cases. However, in 3 reported cases the pulmonary capillary venous pressure rose, and

this rise was accompanied by an increase in cardiac output and a decrease in pulmonary-artery pressure (table III). This strongly suggests release of pulmonary vasoconstriction, and is similar to the results obtained with acetylcholine by Wood et al. (1957).

With the exception of 3 cases, a fall in pulmonary capillary venous pressure was always accompanied by a fall in pulmonary-artery pressure. This lends support to the view of Wade et al. (1956) that in mitral stenosis changes in pulmonary-artery pressure are closely linked to changes in pulmonary capillary venous pressure, and to our own suggestion that pulmonary arteriolar constriction depends upon increased levels of pulmonary capillary venous pressure (Doyle et al. 1957, Goodwin 1958). However, a fall in pulmonary-artery pressure can occur without a fall in pulmonary capillary venous pressure.

Calculated Pulmonary Resistance

This fell in the majority of cases in which it was high, but in 10 cases it rose. This might suggest that hexamethonium produced pulmonary vasoconstriction, but closer study indicates that this view is fallacious since the apparent increase was due to a greater fall in output than in pressures. Thus, in these circumstances, calculation of resistance can be misleading. However, a greater fall in pulmonary than in systemic resistance occurred in 4 of our own cases and suggested primary pulmonary vasodilatation.

Primary Pulmonary Vasodilatation and Autonomic Control of the Pulmonary Vasculature

The paucity of nerve-endings to the pulmonary vessels, noted by Brenner (1935), is often cited as evidence against important neurogenic control.

Views have been varied and contradictory, but the general weight of opinion denies any primary effect on the pulmonary vasculature by ganglion-blocking agents.

Many workers have ascribed the reduction in pulmonary-artery pressure to a passive effect on the pulmonary vasculature resulting from a fall in peripheral resistance and displacement of blood from the lesser to the greater circulation (Sarnoff and Berglund 1952, Sarnoff et al. 1953, Rakita and Sancetta 1953, Storstein and Tveten 1954). Lee et al. (1954), who obtained no change in the response of the pulmonary-artery pressure to the Valsalva manœuvre after tetraethylammonium chloride, concluded that changes in pulmonary-artery pressure were purely passive and secondary to changes in the greater circulation in the normal subject. Daley (1957) was unable to find in dogs any evidence of neurogenically maintained pulmonary vascular tone, and considered that the only factors producing an increase in pulmonary vascular resistance were hypoxia and direct occlusion of small pulmonary vessels.

Cournand (1957) reported failure of sympathectomy to prevent hypoxic pulmonary vasoconstriction in man.

Storstein and Tveten (1954), who studied patients with various types of heart-disease, including mitral stenosis, stated that, since the fall in pulmonary capillary venous pressure was always the same as that in pulmonary-artery pressure, the latter was due to reduction in left-atrial or left-ventricular pressure rather than to direct active pulmonary vasodilatation. This explanation would undoubtedly hold for patients with hypertensive left-ventricular insufficiency and a raised left-ventricular filling pressure and left-atrial pressure, but is difficult to accept unreservedly in patients with mitral obstruction, and presumably normal left-ventricular pressure. However, Wade et al. (1956) made the same suggestion in patients with mitral disease, claiming that the fall in pulmonary-artery pressure was due entirely to a preceding fall in pulmonary capillary venous pressure, which they suggested was due to a local reflex, denying any autonomic control.

In the face of such powerful evidence to the contrary, the onus of proof of neurogenic control lies with its protagonists, and it must be admitted that the evidence is scanty and not always beyond reproach.

In 1950 Fowler et al., working with tetraethylammonium chloride in patients with cardiac disease other than mitral stenosis, believed that the fall in pulmonary-artery pressure was partly due to a direct effect on the pulmonary vasculature. Greene and Bunnell (1950) thought that the fall in cardiac output was insufficient to explain the extent of the fall in pulmonary-artery pressure, and therefore argued in favour of a direct action. Halmágyi et al. (1953) came to similar conclusions, but without definite proof. Gilmore et al. (1952) found that hexamethonium produced a maximum fall in pulmonary vascular pressure in the feet-down position, when the cardiopulmonary blood-volume increased, and concluded that hexamethonium blocked postural pulmonary vasoconstrictor impulses. Sarnoff et al. (Sarnoff and Berglund 1952, Sarnoff et al. 1953), however, believe that in animals the cardiopulmonary blood-volume is reduced rather than increased after methonium.

Thaddeus et al. (1953) considered that the fall in pulmonary-artery pressure produced by tetraethylammonium bromide and by theophylline was due to direct pulmonary vasodilatation. Scott et al. (1955) came to the same conclusions in patients with mitral stenosis, in some of whom they noted a fall in pulmonary vascular resistance.

Balchum et al. (1957), in an intensive study, found that the pulmonary arteriolar resistance fell more than either total pulmonary or systemic resistance, and attributed this to release of pulmonary vasoconstriction. However, resistances are indirectly deduced from measurements of cardiac output and pressures, and, as has already been stressed, are therefore open to possible fallacy. But 3 of their cases showed a fall in pulmonary-artery pressure with rise in pulmonary capillary venous pressure and output, strongly suggestive of a direct vascular effect.

Finally, the careful work of de Burgh Daly and his colleagues (Daly et al. 1954, Daly 1956) strongly suggests the presence of both vasoconstrictor and vasodilator nerve-fibres in the lungs in dogs.

In our opinion the varying results and conclusions as to the effects of ganglion-blocking drugs on the pulmonary circulation have been due largely to failure to appreciate the multiple and complex actions which these drugs may have on the circulation. Thus in many cases any possible direct effect on the lung vessels has been obscured by systemic effects—notably the fall in cardiac output and systemic pressure which almost invariably follows a large dose. A selective effect may be revealed with smaller doses. Other factors also play a part, such as the level of general sympathetic tone at the time of study and changes in heart-rate.

The results of this analysis of our own and of other studies with ganglion-blocking agents, do not, in the majority of cases, indicate any selective action upon the pulmonary blood-vessels. However, the finding of a fall in pulmonary-artery pressure with a rise in cardiac output, and of the same effect with a rise in pulmonary capillary venous pressure, strongly suggests that methonium is capable of producing a direct release of pulmonary vasoconstrictor tone, which must be due to inhibition of autonomic impulses, indicating the presence of some neurogenically maintained vascular tone. We do not suggest that this is necessarily the only factor concerned in arteriolar and venous constriction in mitral disease; indeed, we believe that it is probably merely one factor, of unknown importance.

We have previously suggested (Doyle et al. 1957, Goodwin 1958) that the pulmonary arterial narrowing

and increase in arteriolar resistance in mitral disease is due mainly to vasoconstriction secondary to increases in left atrial pressure, although other factors, such as hypoxia and turgid inelastic lungs, may also be implicated (Goodwin 1958). Increases in bronchomotor tone, leading to air trapping and compression of pulmonary capillaries, has been suggested as another factor (Rodbard 1953). The work of Wood et al. (1957) and Cournand (1957) with acetylcholine has convincingly demonstrated release of pulmonary arteriolar constriction, due, in their opinion, to a local action on the blood-vessels. The present analysis suggests that interruption of vasoconstrictor nervous impulses may also play a part. Cournand (1957) found that the effect of acetylcholine was greatest when the pulmonary-artery pressure had been increased by hypoxia, which is usually believed to produce pulmonary vasoconstriction by a direct action which can, however, be potentiated by stimulation of the stellate ganglia (Nisell 1950). Pre-capillary constriction may be a direct effect of low oxygen tension in pulmonary venous blood (Doyle et al. 1952). However, Judson et al. (1954), studying patients with hypoxia who were exercised and given hexamethonium, concluded that sympathetic denervation of the lung abolished the vasoconstrictor effects of anoxia, while Aviado et al. (1957) in studies on dogs claimed that hypoxia caused reflex vasoconstriction of the lung vessels.

The site of action of methonium on the pulmonary vascular system is uncertain. We believe that it may act upon both arterioles and veins, as suggested by a fall in pulmonary-artery pressure and pulmonary capillary venous pressure without a fall in cardiac output. It may be that the initial effect is upon the pulmonary venous pressure, followed by a fall in pulmonary-artery pressure. If so we suggest that this reflex is autonomic, rather than local as suggested by Wade et al. (1956).

The diverse and unpredictable effects of ganglion-blocking agents imply they will have little place in future investigations on the pulmonary circulation.

We believe that the evidence indicates that neurogenic influences play some part in the control of pulmonary vascular tone, and that complete denial of their existence is unwarranted. We cannot assess the importance of such neurogenic control, and believe that it may be of relatively minor significance except perhaps when considerable pulmonary vasoconstriction is present.

It has been previously suggested (Davies et al. 1954) that hexamethonium may be useful in the treatment of acute pulmonary œdema in mitral stenosis, and this view has been supported by Yu et al. (1957). In the light of the subsequent experience recorded above we believe that, while it may be effective in some cases, in others the results theoretically might be untoward, in view of this possibility of a fall in output. Patients with severe cardiac obstruction may be dependent upon peripheral vasoconstriction to maintain venous return to the heart; and, if peripheral vasodilation occurs, the venous return may be prejudiced, with dangerous consequences. We have not met this, but we do not now believe that hexamethonium should be routinely employed in the treatment of pulmonary œdema in mitral stenosis. This view in no way denies the value of the drug in pulmonary œdema due to left-ventricular failure resulting from systemic hypertension.

Summary

The effects of ganglion-blocking agents have been analysed in 75 cases of mitral stenosis (32 personal cases, 43 reported cases). The pulmonary-artery pressure fell in the majority; the cardiac output fell in a third, rose in a third, and was unchanged in a third. The pulmonary venous pressure fell in the majority of patients in which it was measured.

In a minority of cases a fall in pulmonary-artery pressure was accompanied by a rise in output, which was interpreted as suggesting release of neurogenically maintained pulmonary vasoconstrictor tone. In 3 cases the pulmonary-artery pressure fell, while the cardiac output and pulmonary venous pressure rose, providing confirmation.

The effects of ganglion-blocking agents are diverse and often unpredictable, the effects on the pulmonary circulation being frequently secondary to changes in the systemic circulation. A few observations, however, have suggested primary pulmonary vasodilatation due to autonomic blockade. Ganglion-blocking agents are unlikely to have a place in future investigations of the pulmonary circulation.

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"... Science is the translation of the voice of Nature into a language simple enough for our limited human capacities to comprehend. The science of which we commonly think is I believe no more than the elementary Chapter I of this translation: exciting, successful, but only the beginning ... Chapter I alone tends to bring with it a feeling of certainty, of intellectual arrogance, of mastery over Nature, of materialism, of absolutism in politics, of discipline towards a common good which we have the temerity to think we are capable of apprehending. Chapter II, as I hesitatingly envisage it, will speak in the quieter tones of probability and uncertainty ... will sometimes switch off its engines to listen to the voice of Nature. ... Scientists are taught to keep the other eye wide open when using a microscope. Literally, it is good practical advice; metaphorically, it is a gem of wisdom."—F. M. REDINGTON, in presidential address to the Society of Actuaries on Oct. 27, 1958.

NOTE ON THE TECHNIQUE OF PARTIAL NEPHRECTOMY

STEPHEN POWER
M.S. Lond., F.R.C.S.

SURGEON, ROYAL LONDON HOMŒOPATHIC HOSPITAL, LONDON, W.C.1

O sancta simplicitas

THE accepted technique for partial nephrectomy is a wedge resection leaving anteroposterior flaps: the cut surfaces are brought together by parenchymal sutures or by plugging the gap with fat and suturing the capsule over it. To such reconstruction of the renal pole there are certain objections. Besides being unlikely to succeed, it is, I believe, unnecessary and may be harmful—for several reasons.

1.—In order to avoid leaving a sump in the renal pelvis the calyx must be divided at its neck. This is not easy at the first attempt if the resection takes the form of a wedge.

2.—We know that the arteries supplying the renal parenchyma are end-arteries, although urological surgeons have always been reluctant to face the implications of this fact. The contributions of Graves (1954, 1956) have put our knowledge on a still firmer basis, while a recent article by Jordan and Tomskey (1957) underlines the risk of any incision in the renal parenchyma. They report 75 cases of nephrolithotomy with complications, such as secondary hæmorrhage, necrosis, and infection, in 25. 11 required nephrectomy. Necrosis in such cases is not necessarily limited to one or other side of the incision: I have seen a whole kidney reduced to purple pulp in the course of a few weeks by an incision on its convex border only a few inches long.

To make the flaps lateral and medial is asking for trouble; but even when they are fashioned in the orthodox way their viability, especially towards the edges, remains in doubt. Here we have a potential area of ischæmia and necrosis with all their sequelæ.

3.—The kidney does not lend itself readily to plastic manœuvres and suturing. Mattress sutures are no longer used because of the danger of strangulation, but even ordinary stitches are almost certain to cut out if they have to contribute to hæmostasis. The renal capsule, on the other hand, is a flimsy structure and may be quite useless for suturing. Should either type of suturing prove ineffective, or only partially effective, a hæmatoma is likely to form between the flaps. In any case their uncertain blood-supply and precarious apposition make it unlikely that they ever unite.

Author's Method

I have found a simple guillotine amputation, leaving a raw surface, perfectly satisfactory. Hæmorrhage is controlled by the assistant's finger and thumb round the kidney itself. I believe that this is much safer than using a clamp on the renal pedicle, which may cut off too much of the blood-supply for too long. Though the appropriate branch of the renal artery can sometimes be tied in the hilum, hæmostatis by this method is ineffective unless the area resected corresponds exactly to the area supplied by the vessel; and there is no safe guide to ensure this.

The line of section should be at the level indicated on the X-ray plate and it should incline only slightly downwards from the horizontal. Bleeding points are underrun with fine catgut figure-of-eight stitches, and some patience is usually required before the task is complete. Next, the pelvis is carefully sutured with the same material. As with mucous membranes in general, healing here is very satisfactory. The surgeon should now make sure that the middle calyx has not been breached. If it has, it should be sutured: otherwise a fistula may develop. The kidney is then replaced and the perinephric fat lying against it will stop further oozing. A drain is inserted down to the cut surface and the wound is closed.

Results

I have used this procedure in 10 cases which are summarised in the table. The first patient died during a dental extraction six weeks after his operation, and I was able to examine his kidney. Its lower extremity was soundly healed and looked smooth and healthy.

CONSECUTIVE CASES OF PARTIAL NEPHRECTOMY

No.	Age	Lesion	Operation	Postoperative Course	Remarks
1	52	Calculus in lower calyx	Lower pole removed by radial incision	Healed after slight leakage of urine	—
2	42	Calculus in upper calyx	Upper pole removed by radial incision	Healed after slight discharge	—
3	67	Large calculus and gravel in lower calyx	Lower pole removed by radial incision	Healed after slight leakage	—
4	—	Calculus, 4 cm. across, in right pelvis: gravel and sand in other calyces of both kidneys	Pyelolithotomy and removal of lower pole by radial incision on the right	No leakage; but patient developed hemiplegia and became insane	—
5	58	Small concretion in lower calyx	Lower pole removed by radial incision	No leakage	Considerable pain before operation
6	37	Small concretion in lower calyx	Lower pole removed by radial incision after dividing artery to the pole	No leakage	Persistent pain before operation
7	50	Previous pyelolithotomy: calculus, size of hazel nut, in small intrarenal pelvis: another fragment in lower calyx	Lower pole removed by radial incision: calculus from pelvis removed through neck of calyx	No leakage	To remove calculus by pyelolithotomy would have been extremely difficult or impossible
8	22	Calculus fixed in lower calyx for 18 months	Calculus slipped into pelvis: extricated after lower pole removed by radial incision	No leakage	—
9	34	Double ureter and pelvis: pyelectasis of lower part, possibly tuberculous	Resection of lower part after tying off vessels to it	No leakage	Streptomycin given in another hospital
10	52	Calculus, size of hazel nut, in lower calyx: slipped into pelvis at the time of operation	Lower pole removed by radial incision: calculus retrieved	Very slight leakage for 2½ months	Considerable perinephric œdema: pelvis œdematous and friable at operation

It will be noticed that in 2 patients quite a small calculus caused considerable pain which was relieved after the operation. In both these patients it was considered safer to perform a partial nephrectomy than to explore the parenchyma for the calculus. The operation also removed the stone-bearing area.

Summary

A simplified technique of partial nephrectomy is described. It is based on guillotine amputation of the affected pole. Its advantages were seen in 10 cases.

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IONISED, PROTEIN-BOUND, AND COMPLEXED CALCIUM IN THE PLASMA IN PRIMARY HYPERPARATHYROIDISM

H. M. LLOYD
D.M. Oxon., M.R.C.P.

G. ALAN ROSE
D.M. Oxon., A.R.I.C.

From the Medical Unit, University College Hospital, London, W.C.1

CALCIUM is present in plasma in the ionised, complexed, and protein-bound states. Although the three fractions are believed to be in equilibrium with one another, the level of the ionised calcium is regarded as the most immediately related to the activity of the parathyroid glands (Neuman and Neuman 1958, McLean 1956, 1958). This view has been based on little direct evidence, however, since until recently the only method for measuring the plasma ionised calcium was the biological assay of McLean and Hastings (1934). Rose (1957) has devised a chemical method for measuring the plasma-calcium fractions, and Fanconi and Rose (1958) have reported results obtained with this method in various diseases. They investigated 5 cases of primary hyperparathyroidism, and in each of these the plasma ionised calcium was above normal. Furthermore their results suggested that, in this disease, the ability of the plasma-proteins to bind calcium might be reduced.

We report here the results of measurement of the plasma-calcium fractions in 17 patients with primary hyperparathyroidism. We are especially concerned to note the value of these measurements for the diagnosis of the disorder.

TABLE II—CALCIUM FRACTIONS (MG. PER 100 ML.) AND OTHER DATA ON 17 PATIENTS WITH PARATHYROID ADENOMAS

Case no.	Pre- or post-removal of adenoma	Total in plasma	Plasma-calcium fractions in plasma water				Alveolar CO_2 (mm. Hg)	pH calc.
			Total	Ionised	Complexed	Protein-bound		
1	Pre	13·0	13·7	9·5	0·4	3·8	30·8	7·42
	Post	6·9	7·3	3·7	0·9	2·7	29·8	7·28
2	Pre	10·4	11·0	7·4	0·1	3·5	40·0	7·41
	Post	9·0	9·6	5·3	0·4	3·9	37·6	7·46
3	Pre	10·6	11·2	7·6	0·5	3·1	39·0	7·47
	Post	7·1	7·6	5·0	0·2	2·4	33·2	7·50
4	Pre	11·9	12·6	9·1	0·2	3·2	37·1	7·45
	Post	5·1	5·4	3·0	0·4	2·0	30·3	7·51
5	Pre	11·8	12·7	8·1	0·2	4·4	35·5	7·49
	Post	8·0	8·5	5·1	0·4	3·0	31·8	7·52
6	Pre	11·1	11·9	8·0	0·3	3·6	34·6	7·43
	Post	8·2	8·8	4·9	0·3	3·6	37·4	7·47
7	Pre	11·5	12·3	8·1	0·2	4·1	39·9	7·47
	Post	9·0	9·6	5·5	0·4	3·8	37·7	7·43
8	Pre	10·9	11·7	7·1	0·1	4·5	32·7	7·47
	Post	9·3	9·9	5·9	0·4	3·6	32·2	7·50
9	Pre	10·9	11·7	7·1	0·1	4·5	36·9	7·47
	Pre	11·2	12·0	7·6	0·2	4·2	34·8	7·48
	Post	10·2	10·8	6·0	0·3	4·5	37·1	7·33
10	Pre	10·7	11·4	7·2	0·1	4·2	37·3	7·47
	Post	8·1	8·7	5·0	0·3	3·5	34·9	7·46
11	Pre	11·5	12·3	7·7	0·2	4·4	34·6	7·50
	Pre	12·5	13·3	8·0	0·2	5·1	38·9	7·46
	Post	8·7	9·3	5·5	0·1	3·6	30·0	7·36
12	Pre	10·1	10·8	6·8	0·2	3·8	39·9	7·41
	Pre	10·1	10·8	6·8	0·2	3·8	41·7	7·50
	Post	10·0	10·7	6·0	0·3	4·4	41·2	7·42
13	Pre	12·0	12·7	7·0	1·9	3·8	28·0	7·42
14	Pre	13·1	14·0	9·0	0·2	4·8	28·4	7·50
15	Pre	10·9	11·6	7·4	0·2	4·0	33·3	7·48
16	Pre	13·6	14·5	9·5	0·4	4·6	32·4	7·49
17	Pre	9·7	10·4	6·1	0·5	3·8	34·2	7·39
Normal	Control	9·6	10·2	6·0	0·3	3·9	37·3	7·49
	after parathormone	11·2	12·1	7·5	0·1	4·5	41·0	7·45

Investigation

17 patients with primary hyperparathyroidism were studied. In 16 of them the condition was shown to be due to a single

TABLE I—DATA ON 17 PATIENTS WITH PARATHYROID ADENOMA

Case no.	Sex	Age (yr.)	History	Radiological evidence of parathyroid bone disease	Renal stones or nephrocalcinosis (radiological)	Untreated and preoperative biochemical data				
						Plasma				Urinary calcium (mg. per day)
						Calcium	Phosphorus	Urea	Alkaline phosphatase (K.-A. units)	
						(mg. per 100 ml.)				
1*	F	44	Bilateral renal calculi 7 yr. ago; recurrent urinary infections 2 yr.	No	Stones	12·3–13·9	3·3	69	3·4	255
2*	F	53	Recurrent renal colic 1 yr.	No	Stones	10·2–10·9	2·7	27	13	235
3	F	60	Recurrent pain in loins 8 yr.	No	Stones	10·6–10·8	2·3	30	11	447
4	F	52	Pains in legs 7 yr.	Yes	No	12·4	1·8	21	54	244
5	F	48	No symptoms related to hyperparathyroidism	No	No	11·8–12·8	2·4	42	7·1	600
6	F	34	Pain in rt. loin 6 yr.	No	Nephrocalcinosis	11·1–11·4	2·9	21	7·5	354
7	F	53	Recurrent dysuria 19 yr.	No	Nephrocalcinosis	11·5	2·0	30	10	478
8	F	46	Pain in loins, dysuria, hæmaturia, 2 mos.	No	No	10·4–10·9	1·9	30	5·7	380
9	F	21	Recurrent renal colic 4 yr.	No	Stones	11·8	2·8	24	6	420
10	M	42	Recurrent renal colic 19 yr.	No	Stones	10·7–11·1	2·7	33	11·3	730
11	M	58	Recurrent renal colic 30 yr.	No	Stones	12·0	2·4	39	9·6	530
12	M	23	Pains in loins 16 mos.; one attack rt. renal colic	No	Nephrocalcinosis	10·1–10·6	3·2	66	5	441
13*	F	66	Pains in back, rt. hip, arms 3 yr.	Yes	Stones	10·8–12·2	4·1	96	102	84
14*	F	31	Pains in back 2½ yr.	Yes	No	12·2–15·0	1·5	30	50	520
15	F	49	Pains in lt. loin 3½ yr.	No	Stones	11·5	2·4	30	10	285
16†	M	50	3 yr.	No	Stones	15·0	2·7	24	12	475
17‡	F	43	Recurrent dysuria 2½ yr.	No	Nephrocalcinosis	11·0	2·2	20	5	368

* Previously reported by Fanconi and Rose (1958).
† Under Dr. Dudley Hart at the Westminster Hospital, London.
‡ Under Dr. A. R. Harrison and Mr. J. D. Fergusson at St. Philip's Hospital, Institute of Urology, London.

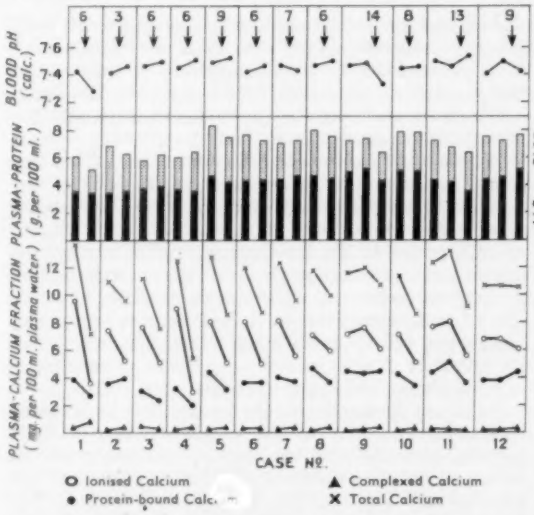

Fig. 1—Plasma-calcium fractions and other related data on 12 patients before and after removal of parathyroid adenoma. In each case the operation is indicated by an arrow, the adjacent numeral indicating the number of days between operation and the postoperative measurements.

chief-cell adenoma, which was removed by Mr. D. R. Davies. In the remaining patient (case 14) explorations of the neck and mediastinum were negative but the diagnosis is not in doubt (see Fanconi and Rose 1958). 4 of the patients have been previously reported (Fanconi and Rose 1958), and the rest are new cases. The plasma-calcium fractions were measured before and after removal of the adenoma in 12 patients and before operation only in the 5 other patients. The biochemical methods used were those of Fanconi and Rose (1958). The plasma-proteins were determined by the biuret method of Harrison (1957).

As a result of the investigations on patients, it was considered desirable to investigate the effect of administering parathyroid hormone to a healthy volunteer. Accordingly, the plasma-calcium fractions were measured before and after five intramuscular injections of 400 *U.S.P.* units of 'Parathormone' (Eli Lilly) given at intervals of approximately twelve hours.

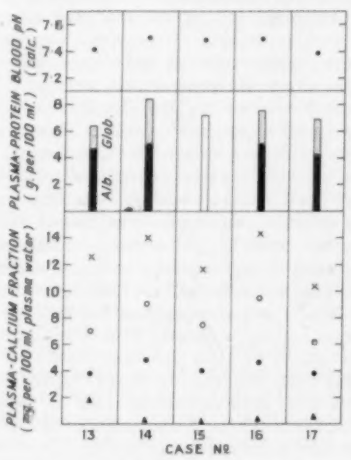

Fig. 2.

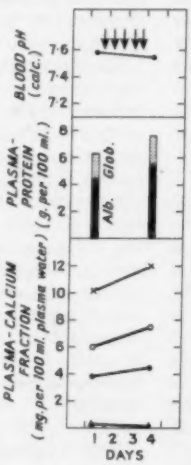

Fig. 3.

Fig. 2—Plasma-calcium fractions and other related data on 5 patients before removal of parathyroid adenoma. Symbols as in fig. 1.

Fig. 3—Plasma-calcium fractions and other related data before and after administration of parathormone to a healthy subject. Each arrow indicates the intramuscular injection of 400 U.S.P. units of parathormone. For identification of calcium fractions see fig. 1.

Results

Brief clinical data of the 17 patients are given in table I. Other results are shown in table II and in figs. 1–3. In table II values are given for plasma-calcium fractions, albumin, globulin, and pH calculated indirectly from the plasma-bicarbonate content and the CO_2 content of alveolar air. The figures illustrate the results obtained for the patients investigated before and after operation (fig. 1); for patients investigated before operation only (fig. 2); and for the healthy subject before and after administration of parathyroid extract (fig. 3).

Discussion

Rose (1957) and Fanconi and Rose (1958) found that the normal limits of plasma ionised calcium, measured by the method used here, were 5·9–6·5 mg. per 100 ml. plasma water. The normal limits of protein-bound calcium obtained by Fanconi and Rose (1958) were 3·4–3·9 mg. per 100 ml. plasma water. Our normal values obtained (but not now reported) at the time of this work agree with those previously given.

Fanconi and Rose (1958) reported that in the 5 cases of primary hyperparathyroidism which they studied the plasma complexed calcium was raised only when the blood-urea was above approximately 100 mg. per 100 ml. Since only 1 (case 12) of the 13 new patients now reported had a raised blood-urea, and in this case the level was well below 100 mg. per 100 ml., we expected to find that the plasma complexed calcium levels were normal (at or below 0·5 mg. per 100 ml.) in all of these patients. This expectation was fulfilled, so confirming the earlier report that primary hyperparathyroidism does not cause a raised plasma complexed calcium unless there is also severe renal glomerular damage.

In 16 of the 17 patients who had hyperparathyroidism the plasma ionised calcium was invariably high. The one exception was a woman (case 17) whose total plasma-calcium had been slightly raised both at previous and at subsequent estimations, whereas on the day when the calcium fractions were measured the total plasma-calcium was normal. This patient's parathyroid adenoma was found to contain a focus of degeneration, and it is probable that an episode of degeneration, with transient remission in the disease, coincided with the fall in the total plasma-calcium and with our measurements. (Such a phenomenon was reported by Howard et al. [1953] and has also been observed by Prof. C. E. Dent at this hospital.) We have therefore concluded from this series that in patients with active parathyroid adenomas the plasma ionised calcium is always raised.

McLean and Hastings (1935a) expressed the relationship between the ionised and the protein-bound fractions of calcium in normal plasma as follows:

$$\frac{(Ca^{++}) \times (Prot^{--})}{(CaProt)} = K$$

It follows from this that if the plasma-protein level remains constant, an increase in the concentration of the calcium ions must be accompanied by a propor-

tionate increase in the protein-bound fraction. Using their biological assay for ionised calcium, these workers found that the equation was obeyed in the 1 case of hyperparathyroidism studied, in hypoparathyroidism, and after administration of parathyroid extract to man and animals (McLean and Hastings 1935b). On the other hand, Ludewig et al. (1942) concluded that the equation was unreliable, and Sartori (1955) found that it did not apply to hypocalcæmic conditions in man.

Although we know of no recent reports of the measurement of the plasma ionised calcium in primary hyperparathyroidism except that of Fanconi and Rose (1958), evidence derived by Hopkins et al. (1953) from the measurement of the ultrafiltrable (i.e., ionised and complexed) calcium in this disease supported the McLean-Hastings equation. They stated that in the presence of an increased plasma-calcium, measurement of the ultrafiltrable calcium was of no value in establishing the diagnosis of hyperparathyroidism. Inspection of our results (figs. 1 and 2) shows that, whereas the plasma ionised calcium is always high in patients with active parathyroid adenoma, the protein-bound fraction (in actual concentration) may be normal or only slightly raised. Furthermore, in each case (fig. 1) the postoperative fall in the ionised fraction was relatively much greater than the fall in the protein-bound fraction. Finally, whereas operation was always followed by a fall in the ionised fraction to normal or below normal, the level of the protein-bound fraction remained the same or, in 4 patients (cases 2, 6, 9, and 12), was even increased. Such results are unexpected on the basis of the McLean and Hastings hypothesis, but do not in fact represent an entirely new finding. Thus, Hellstrom (1953) reported 3 patients with primary hyperparathyroidism, in whom the levels of serum calcium were normal but the values for the diffusible calcium were above normal. After removal of the adenomas of his cases, the level of the plasma-diffusible calcium fell while the protein-bound fraction remained virtually unchanged in 1 case and increased in the other 2. However, Hellstrom did not include values for plasma-proteins, nor did he describe his methods for determining diffusible calcium. In 1 of the patients reported by Hopkins et al. (1953), removal of the parathyroid adenoma was followed by a temporary rise to above normal in the percentage of protein-bound calcium, there having been no change in the level of the plasma-proteins.

In the presence of increased ionised calcium, a normal protein-bound-calcium level may be explained either by reduction in the level of plasma-proteins or by reduction in the ability of the plasma-proteins, present in normal concentrations, to bind calcium—as a result, for example, of a fall in blood pH (McLean and Hastings 1935a). In our cases the level of plasma-proteins was normal, and the plasma pH was normal or nearly normal. Hence the parathyroid adenoma was accompanied by a reduction of ability of the plasma-proteins to bind calcium. This was abolished in the postoperative state without significant changes in the level of the plasma-proteins or plasma pH. We presume that the plasma-proteins are modified by parathyroid hormone in such a way as to produce this reduced ability to bind calcium, and if this is so it represents a hitherto undescribed property of the hormone. At present it is impossible to specify how such a change in plasma-proteins may come about; but since most of our postoperative measurements were within a week, and one within three days, of removal of the adenoma, it is unlikely that the formation of new plasma-proteins with different properties could have occurred. It is more likely that parathyroid hormone modifies the molecular configuration of circulating plasma-proteins, causing a change in the chelating ability of atoms situated near the carboxylic-acid groups in the protein molecule.

The binding of calcium by pure albumin prepared from sera of patients with primary hyperparathyroidism was investigated by Martin and Perkins (1951, 1953) using entirely different methods. The serum-albumin from the patients possessed greater calcium-binding power than normal serum-albumin so that their results appear to be the opposite to ours. In view of their methods, however, which involved fractionation of albumin from serum, and equilibrium dialysis at pH 6·3–6·9, it is difficult to assess the relevance of their results to the state of calcium in vivo, in whole plasma, and at physiological pH.

To obtain further evidence that parathyroid hormone reduces the capacity of the plasma-proteins to bind calcium, the effect of injections of parathormone on the plasma-calcium fractions of a healthy volunteer was investigated. The total plasma-calcium rose from 10·2 before to 12·1 mg. per 100 ml. plasma water after the injections and the ionised fraction rose from 6·0 to 7·5 mg. per 100 ml. plasma water (fig. 3). The protein-bound fraction rose almost in proportion, from 3·9 to 4·5 mg. per 100 ml. plasma water; but this rise is less than would be expected from the rise in the level of plasma-proteins from 6·2 to 7·7 g. per 100 ml. which resulted from the polyuria and dehydration experienced by the subject. The experiment therefore demonstrated that parathormone caused a rise in plasma ionised calcium, but a fall in the ability (other things being equal) of the plasma-proteins to bind calcium.

The effect of administration of parathyroid extract on the plasma ultrafiltrable calcium of normal subjects has been investigated by Hopkins et al. (1953) and Terepka et al. (1958). Both groups of workers found that the hypercalcæmia produced by the extract was accompanied by no alteration in the percentage of calcium that was ultrafiltrable.

We are therefore at variance not only with these workers with regard to the effect of administered parathyroid extract, but also with Hopkins et al. (1953) on the subject of the changes in primary hyperparathyroidism. It seems probable that technical factors account for the disagreement. Hopkins et al. (1953) controlled plasma pH by equilibration with 5% CO_2 and worked at room temperature. Terepka et al. (1958) equilibrated the plasma with 5% CO_2, but worked at 37°C. However, the normal alveolar CO_2 pressure only approximates to 5% of atmospheric pressure (Fitzgerald and Haldane 1905, Goodland and Pommerenke 1952); and in patients with metabolic diseases there may be wide deviations from this figure, as shown in the results of Fanconi and Rose (1958). We wish to stress again the importance of measuring the alveolar CO_2 tension of each individual, and of ultrafiltering in the presence of the same concentration of CO_2.

Our conclusions have some important practical implications. In the diagnosis of primary hyperparathyroidism, great reliance is placed upon the plasma-calcium level. When this is not raised, the diagnosis is often considered to be untenable, although proved cases with normal levels of plasma-calcium have been reported (Gutman et al. 1936, Hellstrom 1953, Mather 1953). In a discussion of the diagnostic criteria for primary hyperparathyroidism Goldman et al. (1957) stated: "hypercalcæmia is now

often minimal, requiring frequent determination and corroboration by other tests". The lack of hypercalcæmia may be explained by hypoproteinæmia, renal failure, or temporary remission; but all these factors can sometimes be excluded as in the case described by Mather (1953). It is in such difficult diagnostic circumstances that measurement of the plasma ionised calcium may be valuable, since, according to our evidence, it is always raised when a functioning parathyroid adenoma is present. Thus, in 2 of our patients (cases 2 and 12) who had normal plasma proteins and pH, the total plasma-calcium was less than 10·5 mg. per 100 ml. plasma and would be regarded as normal in our department. In 5 other patients (cases 3, 8, 9, 10, 15) it was below 11 mg. per 100 ml. plasma. Studies on case 12 were particularly enlightening.

The main features in his case were renal colic, nephrocalcinosis, and hypercalciuria, without evidence of bone disease. The total plasma-calcium was normal on two occasions (10·7 mg. per 100 ml. plasma water) and since the level of plasma-proteins and the blood pH were normal, the plasma ionised calcium should also have been normal according to previous theories. However, measurements showed that the ionised fraction was raised (6·8 mg. per 100 ml. plasma water) on each of two occasions before operation. Although postoperatively the total plasma-calcium fell by only 0·1 mg. per 100 ml., the plasma-proteins and the blood pH showing little change, measurements showed that there had been a fall in the ionised fraction to normal, this fall having been almost exactly matched by a rise in the protein-bound fraction.

Since the diagnosis of primary hyperparathyroidism can be sustained in the presence of normal total plasma-calcium, and since patients with this disease may present only with hypercalciuria or renal stones and without detectable bone disease, it follows that some of the patients diagnosed as cases of "idiopathic hypercalciuria" (Flocks 1940, Albright et al. 1953) may be suffering from primary hyperparathyroidism. Investigation of "idiopathic hypercalciuria" should therefore include measurement of the plasma ionised calcium, and this must be shown to be normal before the diagnosis of primary hyperparathyroidism can be excluded.

We suggest that the measurement of the plasma ionised calcium has a valuable place in the diagnosis of primary hyperparathyroidism. A raised ionised-calcium level in a patient with a normal total plasma-calcium has great diagnostic value. On the other hand, when there is definite total hypercalcæmia (> 11·5 mg. per 100 ml.) elevation of the plasma ionised fraction is to be expected and the finding is of no additional help in diagnosis. Even in these circumstances, however, measurement of the plasma-calcium fractions may be helpful since we suspect that diminution in the ability of the plasma-proteins to bind calcium is characteristic of hyperparathyroidism.

Summary

The plasma-calcium fractions have been measured in 17 patients with primary hyperparathyroidism. 13 of these cases have not been previously reported. In 13 patients measurements were made both before and after operative removal of the adenoma.

The plasma ionised calcium was raised before operation in every patient, except 1 who was probably in temporary remission.

After removal of the adenoma the plasma ionised calcium always fell to normal or below normal; this fall was proportionately greater than the fall in the protein-bound fraction.

It is inferred that parathyroid hormone reduces the ability of plasma-proteins to bind calcium. This is supported by observation of the effects of parathyroid extract on a healthy subject.

It is possible for a patient with normal total plasma-calcium and with normal plasma-proteins and pH to have a high ionised fraction. This has been observed in 2 patients. In such cases measurement of plasma ionised calcium is a most valuable diagnostic aid.

Measurement of plasma ionised calcium is a valuable screening test for patients with "idiopathic hypercalciuria" in order to exclude primary hyperparathyroidism. If the plasma ionised calcium is raised, the hypercalciuria is not "idiopathic".

We express our gratitude to Prof. C. E. Dent for encouragement. We thank the following physicians and surgeons for allowing access to their patients and for permission to publish: at U.C.H., Professor Dent, Prof. M. L. Rosenheim, Dr. J. C. Hawksley, and Mr. D. R. Davies; at the Westminster Hospital, Dr. Dudley Hart; at St. Philip's Hospital and the Institute of Urology, Dr. A. R. Harrison and Mr. J. D. Fergusson; at Queen Mary's Hospital, Roehampton, Dr. G. E. Hosking. The plasma-protein determinations were kindly performed in the Department of Clinical Pathology, U.C.H.

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ARTERIES OF INTESTINAL WALL IN SYSTEMIC HYPERTENSION

D. S. SHORT
M.A., M.D. Cantab., Ph.D. Lond., M.R.C.P.
LECTURER IN MEDICINE, MIDDLESEX HOSPITAL MEDICAL SCHOOL, LONDON, W.1

THE introduction of postmortem arteriography (Evans 1951) has made it possible to demonstrate approximately the capacity of the arterial bed of any organ, and so to determine the extent to which this capacity is reduced by organic arterial disease. A considerable reduction in the pulmonary arterial bed has been demonstrated in many varieties of pulmonary hypertension, and by correlation of arteriographic and histological findings this reduced vascularity has been shown to be due to two distinct pathological processes (Short 1957): (1) obstruction within the lumen, by thrombus or intimal proliferation, and (2) a diffuse narrowing and indistensibility which has been termed arterial contracture. Arterial contracture in the systemic circulation could play a part in systemic hypertension—a part hitherto unrecognised because such contracture cannot be detected with certainty except by arteriography. I therefore decided to study the arterial

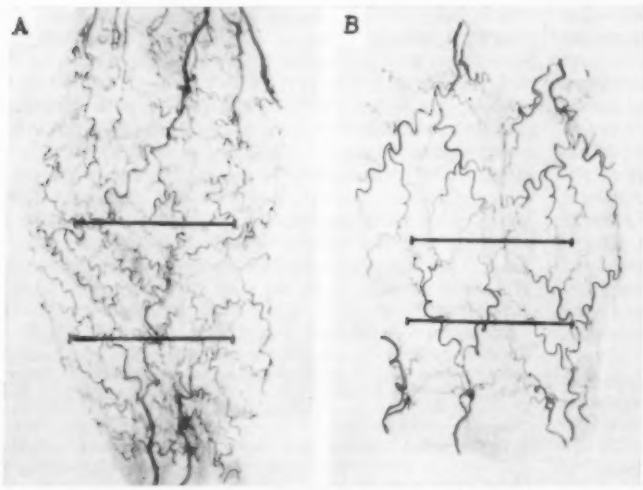

Fig. 1—Contact prints of arteriograms of intestinal submucosa.

A, from a woman aged 78 without hypertension, showing normal vascularity.

B, from a woman aged 82 with established hypertension, showing diminished vascularity. Histological examination showed that the arteries were fully distended by the radio-opaque medium, and that there was only slight patchy intimal thickening.

The two lines, 2·5 cm. long, were used in counting and measuring the arteries (see fig. 3).

bed of the small intestine by means of postmortem arteriography.

Investigation

Method and Material

A bismuth oxychloride-gelatin suspension was injected into the superior mesenteric artery at necropsy by a technique similar to that used in pulmonary arteriography (Short 1956). A pressure of 150–250 mm. Hg was used to ensure that all branches having a potential lumen of 0·03 mm. or more should be distended to their maximum diameter. After fixation, strips of intestinal wall were radiographed on 'Kodaline' standard film from which contact and magnified photographic prints were prepared. The superior mesenteric artery and its branches were then carefully dissected. Blocks of tissue were taken for histological examination from the mesentery and gut wall to confirm that the arteries were fully distended and to determine the cause of any narrowing which might be shown on the arteriogram. All cases in which arteries with a diameter greater than 0·03 mm. were incompletely filled or in which some crenation remained in the elastic laminæ were excluded. In this way "functional" arterial constriction was eliminated and structural changes only were studied.

Besides examining photographs, an attempt was made to obtain some objective estimate of the vascularity of the submucosal plexus. For this purpose, two lines 2·5 cm. long were drawn on the X-ray film along the length of the intestine (fig. 1); one at the farthest point from the attachment of the mesentery; the other parallel to the first and halfway between it and the mesenteric attachment. Using a microscope with a graduated eyepiece, the number of arteries crossing either line was counted and the width of the radio-opaque column in each artery measured.

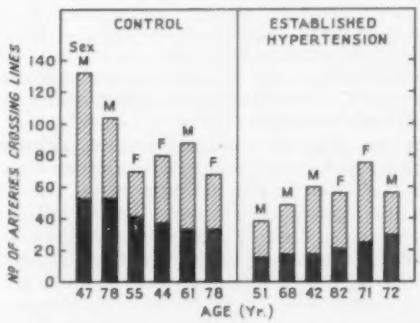

Fig. 3—Diagram comparing the vascularity of the submucosa in cases of hypertension and controls.

The height of each column indicates the number of arteries counted under the microscope crossing the two standard lines shown in fig. 1. The black portion of the column indicates the number of these arteries having a lumen of 0·06–0·2 mm. diameter. In the first four cases of hypertension the reduced vascularity was obvious on the arteriograms. In the remaining two it was not.

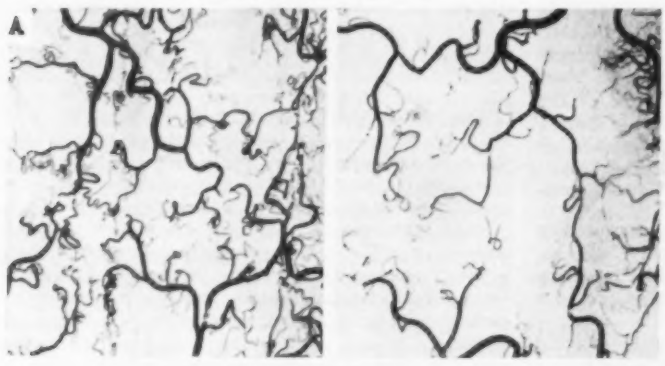

Fig. 2—Magnified arteriograms of the submucosal plexus.

A, from a woman aged 55 without hypertension, showing normal vascularity.

B, from a man aged 51 with established hypertension, showing diminished vascularity. Histological examination showed complete distension of the arteries and no significant intimal thickening.

Complete filling of the submucosal arteries down to 0·03 mm. was obtained in six cases of established hypertension and in six controls. The diagnosis of established hypertension was based on the presence of left ventricular hypertrophy. In one patient the hypertension was in the malignant phase.

Results

Photographic prints showed decreased vascularity in the intestinal wall in four of the six cases of hypertension (figs. 1 and 2). In these cases the arterial lumen appeared to taper more abruptly than in the controls. The count of the arteries crossing the two standard lines showed that there were fewer arteries filled with the opaque medium in cases of hypertension than in controls. This difference was particularly striking when the numbers of arteries with a lumen of 0·06–0·2 mm. diameter was compared (fig. 3).

Histological examination showed only infrequent slight intimal thickening in the submucosal arteries, and no definite medial hypertrophy. In two cases of hypertension, the submucosal pattern was not definitely abnormal. In one of these cases, the lumen of the superior mesenteric artery was greatly narrowed, near its origin, by organised thrombus.

Conclusion

These findings indicate that in some cases of established hypertension the submucosal arteries of the small intestine are in a state of diffuse structural narrowing.

It is suggested that the narrowing of the small arteries in hypertension may be organic in nature and not due to a functional increase in tone as is commonly believed.

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MITRAL VALVOTOMY IN THE YOUNG

IAN R. GRAY
M.D. Lond., M.D. Wisconsin, M.R.C.P.

CONSULTANT PHYSICIAN AND CARDIOLOGIST, THE COVENTRY HOSPITALS AND THE BIRMINGHAM REGIONAL THORACIC CENTRE, HERTFORD HILL

IT has been argued that mitral valvotomy should not be undertaken in childhood or adolescence because of the risk of operating during a phase of active rheumatic carditis, and because recurrence of rheumatic activity might be provoked (Baker, Brock, and Campbell 1950, Sellors, Bedford, and Somerville 1953). A severe degree of valvular obstruction seldom develops until adult life, so that the decision to operate at an earlier age does not often have to be made. In this report I describe three young patients with severe mitral stenosis who have recently had successful operations.

Case-reports

Case 1.—A girl began having paroxysmal nocturnal dyspnœa at the age of 11 years and 10 months. Three attacks occurred in 3 months and her effort-tolerance, which was previously normal, deteriorated so much that she had to walk slowly even on the level, and became breathless on stairs and hills. There was no history of rheumatic fever or chorea. There were signs of mitral stenosis with a loud first heart sound, an opening snap, full-length diastolic and atrial systolic murmurs, and a thrill at the apex. A left parasternal lift, with a pulmonary ejection click and loud pulmonary-valve closure, suggested pulmonary hypertension. While resting in hospital she had a fourth attack of pulmonary œdema. The electrocardiogram (E.C.G.) showed right ventricular hypertrophy. A skiagram of the chest showed pulmonary congestion with interlobular lines at the bases, and moderate enlargement of the left atrium. The results of cardiac catheterisation are shown in the table.

Mitral valvotomy was performed when she was 12 years and 6 months old. The lungs were œdematous. There was tight mitral stenosis without regurgitation, and the valve orifice was estimated to be $1{\cdot}25 \times 0{\cdot}5$ cm. Almost complete separation of both commissures was obtained, giving an apparently normally functioning valve. The valve ring was judged to be rather small.

Histological examination of the auricular appendage showed no evidence of rheumatic activity.

Recovery after operation has been virtually complete. The effort tolerance has become normal, and her weight increased by 2 stone in the first 9 months. The signs of mitral stenosis persist but are less emphatic. She takes oral penicillin daily.

Case 2.—A boy attended hospital at 14 years and 3 months complaining of increasing breathlessness for the past year. He could not hurry or walk uphill without distress, and he was unable to play with other children. He had never had rheumatic fever but there had been a " nervous " ailment, possibly chorea, between the ages of 2 and 7 years. There were signs of mitral stenosis with a loud first heart sound, an opening snap, and full-length diastolic and atrial systolic murmurs with a thrill at the apex. Pulmonary hypertension was suggested by a left parasternal lift, an ejection click, and a loud pulmonary second sound; a pulmonary diastolic murmur was heard once. The E.C.G. showed moderate right ventricular hypertrophy. A skiagram of the chest showed pulmonary congestion and interlobular lines at the bases. The right atrium was slightly enlarged, but no enlargement of the left atrium was seen even with careful fluoroscopy. The findings on cardiac catherisation are shown in the table.

Mitral valvotomy was undertaken when he was 14 years and 11 months old. The main pulmonary artery and the pulmonary veins were large. Tight mitral stenosis without regurgitation was found, and the valve orifice was estimated to be $0{\cdot}5 \times 0{\cdot}5$ cm. The lateral commissure separated well, and the medial one slightly. The opening was quite good but there was doubt as to whether it would be adequate when the heart was full-sized.

Histological examination of the auricular appendage showed some fibrosis with round cell and spindle-cell collections, which was consistent with slight activity.

Recovery after operation was satisfactory, and there was considerable improvement in effort tolerance. He takes oral penicillin daily.

Case 3.—This girl was referred to hospital at the age of 16 years and 1 month because mass miniature radiography had shown pulmonary congestion and cardiac enlargement. She had slight breathlessness on effort, but led a normal active life. There were signs of mitral stenosis with a loud first heart sound, an opening snap, and diastolic and atrial systolic murmurs at the apex. She was seen again 6 months later when she had become rather more breathless. There were widespread rales in both lungs, and very pronounced pulmonary congestion on radiography. The E.C.G. showed early right ventricular hypertrophy. There was no history of rheumatic fever or chorea.

Mitral valvotomy was performed at the age of 16 years and 9 months. There was tight mitral stenosis without regurgitation, and the valve orifice was estimated to be $0{\cdot}5 \times 0{\cdot}75$ cm. The lateral commissure separated well and easily, giving a good opening. The medial commissure did not split with the finger and it was not thought necessary to cut it.

Histological examination of the auricular appendage showed no evidence of rheumatic activity.

After operation recovery was uneventful. She has remained well for 2 years, and has a normal effort tolerance.

RESULTS OF CARDIAC CATHETERISATION IN CASES 1 AND 2

Case no.	Age (yr.)	Pressures (mm. Hg above sternal angle)					Cardiac output (litres per min.)	Pulmonary vascular resistance (dynes per cm.$^{-5}$)
		Left atrium* (indirect)	Pulmonary artery	Right ventricle	Right atrium	Brachial artery		
1	$12^{1}/_{2}$	(16)	90/38 (50)	90/−4 (30)	(−2)	92/70 (79)	3·8	720
2	$14^{11}/_{12}$	(8)	64/42 (51)	..	(−5)	90/60 (70)	3·9	800

* Wedged pulmonary arterial pressure. Mean pressures are in parentheses.

Discussion

The clinical features of these three patients resembled in most respects those of adults with severe mitral stenosis. The presenting symptoms were caused by pulmonary congestion with or without pulmonary œdema. The duration of symptoms was shorter than is usual in adults, but this could be explained by the presence of severe valvular obstruction at a period of rapid growth of the body. Thus the increase in cardiac output together with progressive stenosis would accelerate the usual tempo of the disease as in pregnancy. The physical signs and the radiological and electrocardiographic features were characteristic. The two children in whom cardiac catheterisation was performed showed an increase of pulmonary arterial pressure and vascular resistance. There is little doubt that if valvotomy had not been carried out congestive failure or fatal pulmonary œdema would have supervened. The operative findings were identical with those in adults. The degree of surgical relief was satisfactory, though in two patients (cases 1 and 2) the surgeon was doubtful whether the valve orifice would be adequate when growth was complete. In one (case 2) this was because the medial commissure could only be partly separated, and in the other (case 1) the valve ring seemed unduly small. Symptomatic relief was immediate, and there was a striking increase in height and weight of the two younger children (cases 1 and 2) in the months which followed.

The potential dangers of mitral valvotomy in the younger patient are those of operating during active rheumatic infection or of provoking an attack of rheumatic fever afterwards. It was fortunate that none of these three patients had any clinical evidence of active rheumatism, since this would have made the decision whether or not to operate much more difficult. Even so, if there are dangerous symptoms as a result of a severe obstructive lesion, the presence of overt rheumatic activity should be no bar to operation. Brigden (1957) has suggested that the improvement in the nutrition of the myocardium which follows the relief of severe mitral stenosis might influence favourably the course of rheumatic carditis. 40–50% of adults undergoing mitral valvotomy have histological evidence of active rheumatic carditis but its presence or absence has no bearing on the success of the operation. The three cases reported had little, if any, histological evidence of activity despite their youth.

Rheumatic fever seldom occurs after mitral valvotomy. Goodwin et al. (1955) reported 2 examples in a series of 75 operations, and Soloff et al. (1953) found 4 among 179 postoperative patients—an incidence of rather more than 2%. The postvalvotomy syndrome of fever and pericarditis has been regarded as a form of rheumatic carditis (Soloff et al. 1953), but it seems more likely to be a direct consequence of surgical trauma (Wood 1954, Papp and Zion 1956) and unrelated to rheumatic activity. Rheumatic fever in the postoperative period is uncommon and unpredictable. It has not been described in any children, and the possibility is so remote that it need not be considered when deciding whether to operate. There is a definite risk of re-stenosis of the mitral valve after successful valvotomy, especially if active rheumatism should recur, and this risk is obviously greater the younger the patient. It may possibly influence the ultimate course of young patients after valvotomy, but should not affect the indications for operation. Prophylaxis against streptococcal infection with daily oral penicillin is a reasonable postoperative measure, which should be continued throughout adolescence.

The youngest patient with rheumatic mitral stenosis treated by valvotomy was only $4^1/_2$ at the time of operation (Bailey and Bolton 1956). This series of 1000 valvotomies includes 13 patients under the age of 20. Other American authors describe 3 patients aged 12, 14, and 15 (Lurie and Shumacker 1954). There are reports from South Africa of 1 child aged 7 and of 3 aged 14 (Bradlow and Crawshaw 1955), and from Italy of 11 patients aged 8 to 16 among 600 valvotomies (Angelino et al. 1956). The 18 children who are fully described in the last three reports were all seriously disabled and had severe stenosis. In the 4 in whom catheterisation was performed, pulmonary arterial pressure and resistance were high. The results of operation seem to have been uniformly good. There was no instance of postoperative rheumatic fever, and no mortality. The degree of success is at least comparable with that in the most favourable adult cases of mitral stenosis.

Conclusion

Mitral stenosis is not usually considered as a cause of cardiac disability in children, but because of the rapid course it may take its recognition is most important. It may become sufficiently severe during childhood or adolescence for surgical relief to be necessary. Experience with these three patients suggests that valvotomy can be safely undertaken, and that the special risks in young people have been exaggerated. Re-stenosis may be more frequent than in adults, and prophylaxis with oral penicillin is indicated after operation.

Summary

Three patients aged 12, 14, and 16 are described in whom mitral valvotomy was successfully carried out. Despite their youth, none of them had clinical or histological evidence of active carditis, and rheumatic fever was not provoked by the operation. The history of disability was unusually short, for which the increasing circulatory needs of adolescence seem to be responsible.

It is a pleasure to thank Mr. J. L. Collis who carried out the operations; Dr. W. M. Priest for kindly allowing me to include case 3; and Dr. W. W. Brigden for his help and encouragement.

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" . . . Genuine scholars seem to be 'born' and not 'made.' The successful teacher does his part when he discovers the potential scholar and then provides adequate incentive for him to develop his own natural capacities through his own enterprise. The most propitious attributes of character and personality in a potential young scholar and leader are intellectual curiosity, idealism, inspirability, discernment, imaginativeness, zeal for learning and willingness to work, perseverance, optimism, imperturbability, and magnanimity. . . . We may compare the responsible head of a clinical department with the old prospector. In his quest, if he discovers a candidate possessed of such qualities of character as these, he is truly the 'lucky prospector.' "—IRVINE MCQUARRIE, *A.M.A. J. Dis. Child.* 1958, **96**, 563.

Preliminary Communication

IMMEDIATE EFFECT OF TRIIODOTHYROACETIC ACID ON OXYGEN CONSUMPTION OF MYELOID LEUKÆMIC LEUCOCYTES IN VITRO

DEMONSTRATION of an immediate effect of triiodothyroacetic acid (triac) on a human tissue in vitro is of interest for it has proved difficult to confirm that triac has an immediate effect on the oxygen uptake of tissue slices.[1] We report here the effect of *l*-3:5:3′-triiodothyroacetic acid on the oxygen consumption of leucocytes from patients with chronic lymphatic and chronic myeloid leukæmia.

The oxygen consumption of leucocytes (resuspended in a modified Krebs no. 2 buffer) was determined by the direct method in Warburg manometers at 37°C. The number of leucocytes was adjusted to approximately 50 million per flask. The duration of runs was one hour, and results are expressed as μ moles oxygen uptake per hour per 10^{10} leucocytes.

Leucocytes were obtained by venepuncture from 7 patients with chronic myeloid leukæmia and 6 patients with chronic lymphatic leukæmia who were about to start courses of treatment. The range of triac concentrations studied was 0–50 μg. per 100 ml. medium. Triac was added to the leucocyte suspension in the flasks shortly before the period of equilibration—i.e., half an hour before the run started.

The average blood findings of the patients with chronic myeloid leukæmia were: white cells 210,000 per c.mm. (range 80,000–720,000), total myeloid cells 96% (polymorphs 50%, myelocytes 38%, myeloblasts 3%). In those with chronic lymphatic leukæmia the average findings were: white cells 160,000 per c.mm. (range 79,000–282,000), lymphocytes 95%.

DIFFERENCES IN RATE OF OXYGEN UPTAKE BETWEEN CONTROL AND TRIAC-TREATED LEUCOCYTES FROM PATIENTS WITH CHRONIC MYELOID LEUKÆMIA

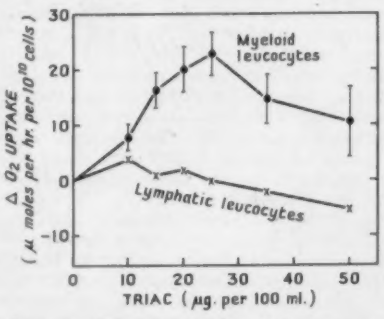
Concentration of triac (μg. per 100 ml.)	Mean ΔO_2 uptake (±S.E. of mean) μ moles per hr. per 10^{10} leucocytes	t	P
10	+7·9±2·3	3·43	<·02
15	+16·3±3·3	4·90	<·01
20	+20·1±4·1	4·89	<·01
25	+22·9±3·8	5·89	<·01
35	+14·9±4·5	3·26	<·02
50	+10·7±6·4	1·65	>·1

ΔO_2 uptake = O_2 uptake (triac-treated leucocytes) − O_2 uptake (control leucocytes). The last column shows the probability according to the t-test regarding the significance of the differences of the means from zero.

Without added triac the mean oxygen consumption of the chronic lymphatic leucocytes (138 ± 14 μ moles oxygen per hour per 10^{10} leucocytes) did not differ significantly from that of the chronic myeloid leucocytes (152 ± 12 μ moles oxygen per hour per 10^{10} leucocytes), which is in accordance with previous studies.[2,3]

When triac was added the myeloid and lymphatic leucocytes responded differently. The myeloid cells showed a significant increase in oxygen consumption at all concentrations from 10 to 35 μg. triac per 100 ml. Stimulation was greatest at 25 μg. per 100 ml.; at this concentration there was a mean increase of 15% in the rate of oxygen consumption (see table). Over the same range of concentrations of triac lymphatic leukæmic leucocytes showed no significant response (see figure).

1. Ciba Foundation Colloquia on Endocrinology; vol. 10. Regulation and Mode of Action of Thyroid Hormones; p. 246. London, 1957.



Relation between triac concentration and oxygen uptake of leukæmic cells in vitro.

We wish to thank the physicians in charge of wards at the Western Infirmary, the Royal Infirmary, and the Southern General Hospital who have permitted us to study patients under their care.

Clinical Chemotherapeutic Research Unit of the Medical Research Council
Department of Biochemistry, Western Infirmary, Glasgow

W. D. ALEXANDER M.B. Glasg.
SHEENAH K. BISSET B.SC. St. And.

Reviews of Books

Clinical Hæmatology in Medical Practice

G. C. DE GRUCHY, M.D. Melb., F.R.A.C.P., M.R.C.P., physician-in-charge, hæmatology research unit, St. Vincent's Hospital, Melbourne. Oxford: Blackwell Scientific Publications. 1958. Pp. 620. 50s.

THIS excellent book differs from previous hæmatological texts in devoting itself almost exclusively to clinical description, differential diagnosis, and treatment of blood diseases. There is no discussion of details of technique (with the exception of bone-marrow biopsy): the application of techniques is, of course, fully described, but for "how-to-do-it" details the reader must go elsewhere. Dr. de Gruchy rightly expects the clinical hæmatologist to be able to examine his own material, especially blood and bone-marrow films. References are almost entirely restricted to short lists of "further reading"; and illustrations are few and all black and white, a choice we applaud because it keeps down the price (surely the time has now come to reproduce coloured illustrations of blood and marrow cells in properly planned atlases—or leave them out altogether).

These self-imposed limitations have enabled Dr. de Gruchy to produce a smooth and remarkably readable text covering every part of clinical hæmatology. It is supported by many well-designed tables: tables setting out the best ways of investigating a given disease, tables contrasting the features of superficially similar syndromes, such as chronic myeloid leukæmia and myelosclerosis, tables of data (largely from Dacie's *Practical Hæmatology*), and tables summarising causes of syndromes, such as the causes of pancytopenia. These tables maintain an admirable sense of proportion: they are not great lists made cumbersome in an endeavour to obtain completeness. In every chapter treatment is described in a practical way; it is surprising that the author still uses tretamine, but otherwise there is no advice to question. The nomenclature throughout is orthodox and there are no idiosyncrasies. Particularly good chapters are those on the normocytic and normochromic microcytic anæmias and on the leukæmias. The section on blood-coagulation disorders is less effective, for an attempt to include all the rare factors has made for unnecessary complexity, and Dr. de Gruchy seems content to hand over this section to the pathologists. Blood-transfusion and blood-groups are dealt with in a mere 25 pages, which puts the subject in its proper clinical perspective. There are few minor errors; the type is clear and the paper good; and all this is offered at a very reasonable price.

In a foreword, Prof. J. V. Dacie says that there is a real need for a new book on hæmatology which bridges the gap between

2. Beck, W. S., Valentine, W. N. *Cancer Res.* 1952, **12**, 818.
3. Bird, R., Clements, J., Becker, L. *Cancer*, 1951, **4**, 1009.

the incomplete descriptions in textbooks of medicine and the large hæmatological reference works. Dr. de Gruchy's volume fills this place very well and it can be warmly commended to all physicians and to senior students who find hæmatology interesting.

World Health

C. FRASER BROCKINGTON, M.D., M.SC., M.R.C.P., professor of social and preventive medicine, University of Manchester. London: Penguin Books. 1958. Pp. 405. 5*s*.

To survey the theory and practice of public health in the whole wide world is a daunting task, and to do so in a cheap book intended for " doctors, nurses, sanitarians, public health engineers, welfare workers, social workers, politicians ", is a design of almost reckless courage. The first part is devoted to definitions of health and sickness and the factors which influence these concepts. The author gets off on the wrong foot with an insufficient definition of ecology which makes no mention of the οἶκος. Indeed, in his hands ecology is a blessed word (like Mesopotamia): it challenges, it gives ground, and it is defeated.

But there is a splendid breadth in the author's conception of public health, based equally on wide reading and on personal experience, and he is determined that his readers shall share his enthusiasm. If at times his pen flits so quickly from chipmunks to nucleoproteins that the connecting link is hard to find, it is a fault which he shares with Thucydides. As a whole this part of the book must command respect and may excite enthusiasm.

Professor Brockington goes on to relate the history of international cooperation in preventive medicine. Few have seen so many facets of the work of W.H.O. and are better qualified to judge its worth. What he says is interesting and encouraging. The last part of the book is an introduction to vital statistics. It is written soberly and logically, and, if it is read by those—especially the politicians—for whom it is intended, can do nothing but good. There is at once a proper emphasis on the unreliability of the raw material of epidemiology and some pertinent examples of what may be made of it.

Minor errors of fact would not matter if the book were intended for the practising hygienist: he has other sources of truth. But human schistosomiasis does not occur naturally in North America, and if the mountaineer does not live " on older geological formations or on sedimentations " he has not much choice beyond recent volcanoes. The book is well supplied with references to authorities and standard textbooks—wonderful value in a book at this price—but there is little attempt to distinguish between the values of fact and legend: Homer is not comparable with the Registrar-General.

It is notoriously difficult to put a quart into a pint pot. This would probably be a better book if it were divided into two parts: one on the history, present state, and prospects of public health, and the other on vital statistics for non-professionals.

New Opportunities for Deaf Children

I. R. EWING, O.B.E., M.SC., D.C.L., A. W. G. EWING, M.A., PH.D., Ellis Llwyd Jones professor and director of the department of education of the deaf, University of Manchester. London: University of London Press. 1958. Pp. 149. 15*s*.

MORE up-to-date information on the problems of the deaf child is badly needed and this book is a great help. The well-known authors have amplified their excellent earlier book by describing their techniques in testing and training deaf and partly deaf children in the light of recent improvements. Their enormous experience and understanding will make the book of great value to parents, teachers, doctors, and those other helpers now called " audiologists ".

The development and maturation of the handicapped child, compared with the child of normal hearing, is well described; and so is the more effective use of the transistor hearing-aids, speech-training units, and group aids, and the help given in developing speech, language, and personality in children with different degrees of hearing loss. The need for early diagnosis is emphasised by an account of the difficulties that arise in training when it is not started in babyhood. The authors point out that special lessons are even more important than modern hearing-aids: and their views seem to demonstrate the real need for many more teachers of the deaf, a number that even a centre like Manchester cannot possibly train.

The case-histories will hearten the reader, for they illustrate the courage and determination of the children, and the patience, fortitude, and faith of parents and teachers.

Principles of Internal Medicine (3rd ed. New York and London: McGraw-Hill. 1958. Pp. 1839. £7 3*s*. 6*d*.).—The third edition of this book, edited by Prof. T. R. Harrison and others, appears only four years after the second, and includes new topics and considerable revision. The book has been reset and its scope enlarged by the slightly smaller type (plus 70 more pages). It is a major textbook of authoritative standing. The original 85 contributors continue, and interesting chapters on heritable disorders of connective tissue (by Dr. Victor McKusick) and a short section on dermatology (by Dr. Donald Pillsbury), with some fine colour illustrations, are added. The section on disorders of nervous function now includes descriptions of most psychiatric disorders; the earlier chapter on delirium, for instance, now covers all the acute confusional states. The chapters on diseases of the liver and diseases of the nervous system have both been rewritten. Harrison's *Medicine* holds a high place among the larger textbooks, for it is remarkably complete and well indexed. It is not cheap but gives good value for its price, having now nearly two thousand pages with good diagrams and illustrations. The new print does not tire the eyes, though the arms may protest at the weight—not far short of ten pounds.

The Pharmacologic Principles of Medical Practice (4th ed. London: Baillière, Tindall, & Cox. 1958. Pp. 1313. 112*s*.).—This well-known American textbook by Prof. John C. Krantz and Dr. C. Jelleff Carr aims at explaining why and how and when drugs should be used in medicine, and it generally does so very satisfactorily. The description of actions and uses is clear, concise, and orthodox and as up to date as possible. For the new edition the text has been considerably revised, and about 140 new drugs have been included. The standard throughout is high, and the chapters on the central nervous system are outstanding, particularly the one on that most difficult of subjects, the use of drugs in mental illness. The chapter on the response of the hæmopoietic system to drugs, especially the section on the treatment of leukæmias and allied conditions, might benefit from further revision, and in future editions the chemotherapy of neoplastic disease could have a chapter of its own. A small criticism is that, although this month's centenary of the death of Richard Bright reminds us of the long association of Guy's Hospital with renal disease, that hospital did not give its name to the famous pill containing digitalis, squill, and calomel. The book can be confidently recommended as an excellent reference work for a department or for the physician who wants to know more about the theoretical bases of his therapeutics.

A Comprehensive Dictionary of Psychological and Psychoanalytical Terms (New York and London: Longmans, Green. 1958. Pp. 594. 60*s*.).—This book by Prof. H. B. English, of Ohio State University, and Mrs. A. C. English, defines more than 13,000 terms used in psychology, psychoanalysis, and allied sciences, such as medicine, mathematics, biology, and sociology. Pronunciation is given in doubtful instances, but no etymological data. There are abundant cross-references, and the relationship of data from allied subjects is constantly emphasised. The authors' views on usage are given liberal scope: they are strongly opposed to bogus erudition and to the use of terms derived from Greek or Latin when there is an English equivalent. Unfortunately, to the other weakness of psychologists, prolixity, they show themselves less sensitive. Nevertheless, the terminology of the two main subjects is well covered and no serious omissions could be detected.

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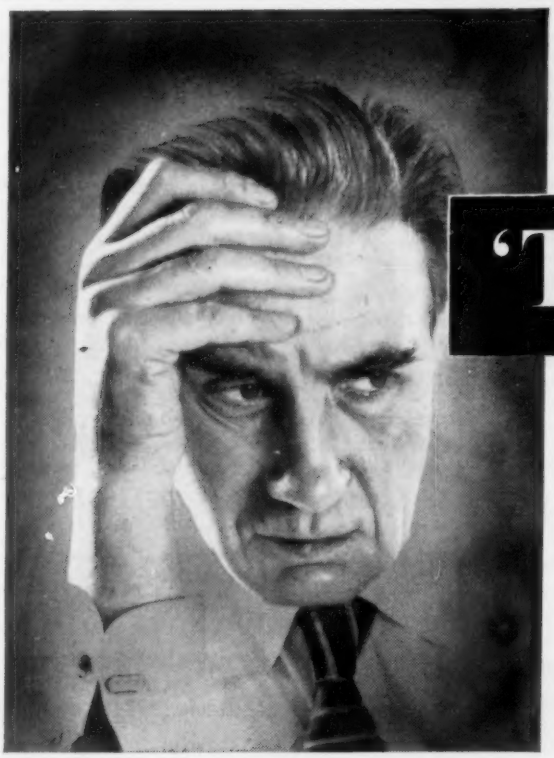

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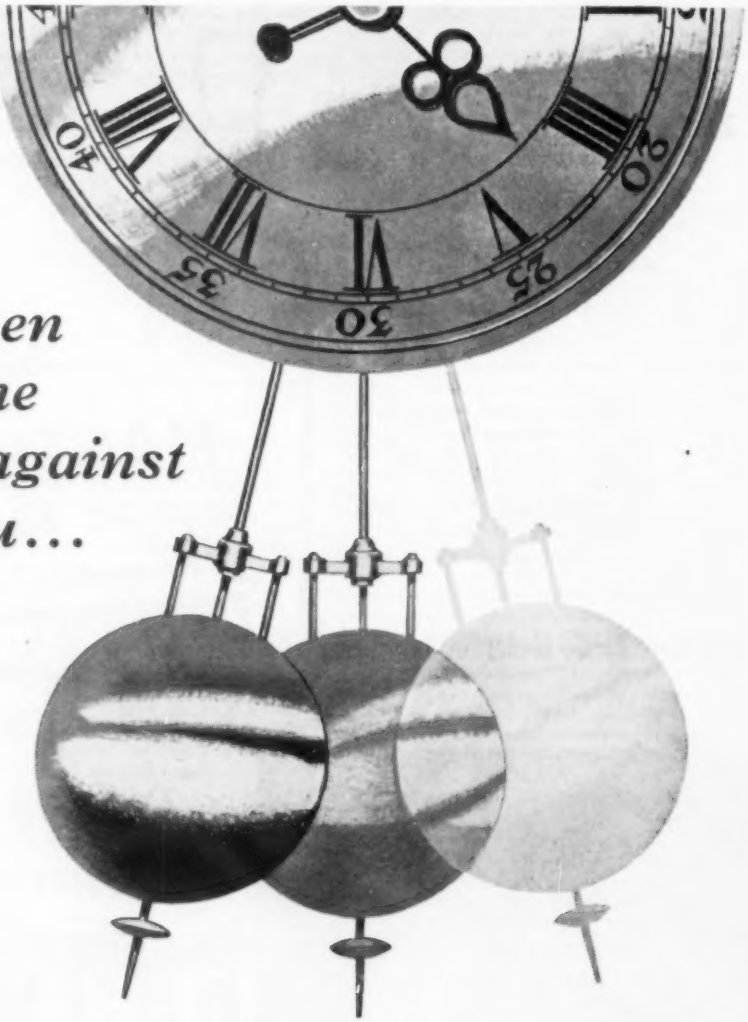

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The Diagnosis of Hyperparathyroidism

HYPERPARATHYROIDISM is not a rare disease.[1 2] A renal stone is often the first manifestation; it may remain the only one, or years later the symptoms of osteitis fibrosa or of hypercalcæmia may appear.[3 4] By this time the diagnosis is not difficult, but renal damage may have become irreversible. The problem is to recognise hyperparathyroidism in the patients who have nothing more than a renal stone. The incidence of hyperparathyroidism in patients with renal stone is 4% and in those with recurrent stones 15%[2 5]; more precise methods of diagnosis might reveal even more cases.

The classical biochemical changes of hyperparathyroidism are a rise in the calcium and a fall in the inorganic-phosphate levels of the plasma, and an increase in the urinary excretion of calcium. Of these the most important is the rise in the plasma-calcium, but in the patients who only have a renal stone (and who on the whole have the smallest adenomas [6]) this increase may be inconstant or too small to be clearly outside the range of normal variation. The changes in the plasma-phosphate level and in the urinary calcium excretion may help to confirm the diagnosis; but they do no more than this, for these values can be normal in patients with hyperparathyroidism, and abnormal in patients with renal stone without hyperparathyroidism—so-called idiopathic hypercalcuria. More elaborate tests have been devised, but their value is not established.[7 8]

If the serum-calcium value is more than 11·5 mg. per 100 ml. exploration of the parathyroid glands is probably justified in a patient with a renal stone. The laboratory should, of course, be able to vouch for the accuracy of the determination, and other causes of hypercalcæmia should be excluded: multiple myeloma, certain malignant diseases, sarcoidosis, vitamin-D poisoning, Paget's disease, and long-continued immobilisation.[9–11]

But what of cases of hyperparathyroidism with a normal plasma-calcium? The plasma-calcium is in three forms—ionised, protein-bound, and complexed with organic acids. The ionised calcium is diffusible, the protein-bound calcium is not diffusible, and the complexed calcium is diffusible but not ionised. The rise in the plasma-calcium level in hyperparathyroidism is primarily in the ionised fraction. Clearly this could be masked if there was, at the same time, a fall in one of the other fractions. This point has very rarely been investigated. Until recently the separate determination of the ionised calcium depended on biological assay using the frog's heart [12]; the results suggested that when the ionised calcium increased, there was at the same time an increase in the protein-bound calcium. ROSE [13] has now evolved a method for determining separately the three fractions of calcium in the plasma. With FANCONI [14] he has published his results in various diseases, and he and Dr. LLOYD in this issue describe their results in 17 cases of hyperparathyroidism.

The ionised-calcium level was always raised in patients with functioning parathyroid adenomas, and when the adenoma was removed the level fell. The corresponding changes in the protein-bound calcium were variable, and in 4 of the patients the protein-bound calcium actually increased after operation. The important and unexpected findings were in 2 patients who before operation had normal values for the total calcium, the proteins, and the pH in the plasma, but in whom the ionised calcium was nevertheless raised. LLOYD and ROSE concluded that the ability of the plasma-proteins to bind calcium may be reduced in hyperparathyroidism. They have certainly shown that a fall in the protein-bound calcium can mask an increase in the ionised calcium in this condition. It seems likely that the separate determination of the ionised calcium will reveal yet more cases of hyperparathyroidism in patients with renal stones, and that it will disclose cases among patients thought to have idiopathic hypercalcuria. But the analysis takes four hours, and relatively few centres can have the necessary facilities to undertake it; therefore it is well to remember that many cases of hyperparathyroidism are missed simply because the plasma-calcium is not measured routinely in patients with calcium stones of the kidney. The determination of the ionised calcium could be reserved for cases where repeated determinations show only an equivocal rise in the total calcium.

Hypercalcæmia occasionally produces a characteristic train of symptoms—anorexia and vomiting, thirst and polyuria, and mental confusion [9]; there may be metastatic deposits of calcium, especially in the cornea. In these patients the difficulty is not in deciding whether the plasma-calcium level is abnormal or not, for it is always very much raised, but in determining the cause of the increase.[11] The condition can be fatal, and, if the cause is hyperparathyroidism, operation is urgent.[15]

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Crime and the Neighbourhood

AMERICAN sociologists have long been interested in the relation between behaviour and habitat, and the ways in which certain forms of conduct are associated with particular local communities. Hitherto disappointingly little on this has been published in Europe; but now two British studies have appeared—one a general study of substandard families in a Liverpool dockland slum,[1] the other an inquiry into the extent of criminal conduct in Croydon.[2]

The ecological study of crime was first developed in Chicago in the 1920s and 1930s and is for ever associated with the name of CLIFFORD SHAW. SHAW and his colleagues suggested that there were definite criminogenic areas in the major American cities, and they supported their theory with much empirical evidence. These areas are characterised by physical deterioration, overcrowding, poverty, the presence of immigrants and a substantial coloured minority, and high rates for mental illness, child mortality, tuberculosis, and both adult and juvenile crime. According to SHAW, as one moved away from the deteriorated zones immediately adjacent to the commercial centre of the city, the incidence of crime and the other associated defects decreased until finally, in the higher-class residential suburbs, they became negligible. Various later studies of British cities have revealed a similar pattern of distribution and have confirmed SHAW's concept of the "delinquency area". The fact that it is in these older, less privileged, blighted parts of the great conurbations that crime is endemic is now widely accepted. What is in dispute is why this should be so. How do these delinquency areas develop in the first place, and why, despite wholesale changes of population, does the crime rate remain more or less constant over successive generations? What factors in the social environment of such localities make a majority of the inhabitants likely to commit offences, and, above all, how can these predisposing factors be controlled?

SHAW spoke of a definite tradition for delinquency which has its roots in the dynamic life of the community. Its vehicle is the small face-to-face group which gives both the stimulus to and offers the rewards for certain forms of illegal behaviour. The price of acceptance by the group is conformity to its norms, and where these norms contain a delinquent element the aspirant to membership must take part in acceptable modes of criminal behaviour. There emerges, then, what is termed a delinquent subculture in which the social norms are in certain important respects at variance with those of the wider society. MAYS' analysis of a Liverpool dockside community[3] supports this hypothesis, and now Dr. MORRIS's study of crime in Croydon has added further confirmation. MORRIS has related the incidence of crime to the different socio-economic groups in the community and concluded that "delinquency may be studied within a class frame of reference". He is careful to point out that crime and immorality are not identical: it is "merely that *legally defined delinquency* is a social characteristic of working classes generally and the family of the unskilled worker in particular". MORRIS's study, like that of MAYS before it, is mainly concerned with what they term "social" as opposed to psychiatrically produced delinquency.

Dr. KERR's study of a selected number of dockland families throws interesting light on some aspects of the working-class subculture which has a characteristically high delinquency-rate. By psychological and anthropological techniques she has explored the interpersonal relationships of families which have lived for more than one generation in a socially deteriorated district. These households are mainly Irish in origin, below average in intelligence and severely handicapped by emotional immaturity. This immaturity is characterised by a matriarchal family structure and the presence of a powerful mother who dominates her children and bullies her kinsfolk. Within the comparative security of their own families these people are able to live fairly well-adjusted lives; but as soon as they are exposed to the differing norms and standards of other social groups they are apt to be ill at ease, unhappy, delinquent, and even mentally disturbed. Such families are the vestigial remains of a more primitive way of life that has been swept away by the tide of industrialisation. Similar submerged and deprived groups are still to be found, according to KERR, in parts of the West Indies and among certain of the Negroes in New York. Such families tend to resist assimilation to the wider culture, and, because their behaviour is in many respects socially unacceptable, they continue to present serious problems with which family casework agencies are obliged to grapple. They are always likely to develop into "problem families" and to produce a regular crop of social incompetents and delinquents.

The importance of these various investigations lies in the clues they offer for treatment and readjustment. People's ideas about how life should be lived and about acceptable and unacceptable behaviour are grounded in their group experience and cannot easily be altered. The significant transmitting agencies for these ideas and values are, in the first instance, the family and, at a later stage, the local society. If we wish to alter these culturally prescribed and socially conditioned attitudes we must discover ways in which family relationships can be changed and social contacts controlled. In so far as the subculture has developed a well-organised behaviour pattern and social code, no amount of tinkering or casual botching is likely to achieve far-reaching changes. Nothing short of drastic surgery will meet the need. It is in terms of physical environment and economic conditions that the remedy must first be sought. The entire removal of families to better conditions in new areas or their rehousing in their old neighbourhood is one important step that must be taken. Secondly, we must see to it that better education is offered to the rising generation so that they may make the best use of whatever skills and aptitudes they possess and are

1. The People of Ship Street. By MADELINE KERR, M.A., PH.D. London: Routledge & Kegan Paul. 1958. Pp. 215. 23s.
2. The Criminal Area. A Study in Social Ecology. By TERENCE MORRIS. London: Routledge & Kegan Paul. 1958. Pp. 202. 25s.
3. Mays, J. B. Growing Up in the City. Liverpool, 1954.

enabled to compete on an equal basis in the employment market. At the same time social workers and social agencies will be required to give them support and reassurance during this very difficult transitional stage. Here the settlements, community centres, youth clubs, churches, and schools have a vital role to play in encouraging these submerged people to achieve social competence and to assimilate the norms of the wider community. Sociologists have revealed the existence of these subcultural pockets. Social justice and social hygiene alike demand that a strenuous endeavour should be made to eliminate them once and for all.

Annotations

NOISE IN HOSPITALS

"DEPRIVED of rest, all prematurely die", wrote Ovid. It is by no means easy to ensure that hospital patients have the rest they need; necessary nursing and medical attention is itself a disturbance, and lights which must be left burning during the night make sleep difficult for some patients.

But the main cause of disturbed rest is usually noise; that much of this is unnecessary has been shown by an inquiry by King Edward's Hospital Fund For London.[1] A questionary was sent to more than two thousand patients in fifteen hospitals; they were asked to comment on the noises which disturbed them most.

Most patients are not worried by a background roar of traffic, at least by day, but this and all other noises become more disturbing at night. Most of the disturbing noises arise either within, or just outside the ward, and are due to faulty (and therefore noisy) equipment, or to thoughtlessness on the part of the staff. These internal disturbances can usually be prevented at little cost, whereas those arising further away (milk crates, a dance hall next door to the hospital) cannot usually be prevented without heavy expenditure. Many patients returned the questionary without comment, and the report concludes that "nearly 50% were not bothered by noises". This is a surprising conclusion—surprising, at any rate, to those of us who have been patients ourselves—and it may be suspected that some of the patients were unable to express their views.

Trolleys, telephones, and lifts are often the noisiest equipment. Trolleys can be greased and lift doors adjusted, but the only solution to the telephone problem is to change the call system. Perhaps the suggestion which patients will welcome most is that polyethylene bowls should replace those of aluminium. To be woken up in what, for most people, is the middle of the night is unpleasant enough; to be woken to the nerve-tearing sound of aluminium bowls clanging against a stainless-steel sink is very much worse. But the best results will probably be achieved by encouraging staff not only to be quiet themselves, but to report noisy equipment. Nurses are not the only offenders; many doctors, called to the ward in the middle of the night, would do well to recall what Hilton said a hundred years ago. In many cases patients themselves are the cause of the disturbance. This is a more intractable problem, and probably the side-ward is the only solution at present. Perhaps the hospitals of the future will include a sound-proof ward for senile patients who become manic at about 3 A.M.

The extent to which illness is prolonged by lack of rest cannot be assessed. Many sound-proofing schemes are considered impracticable owing to their expense; but, now that the care of each inpatient costs over £20 a week, nothing that will hasten recovery can be lightly set aside because of its price.

1. Noise Control in Hospitals. King Edward's Hospital Fund for London, 34, King Street, E.C.2.

ANTIBODIES IN CELLS

MUCH work has been done to determine the site of antibody formation and to identify the cells in the body responsible for the synthesis of antibodies.[1] Ingenious techniques have been devised to determine whether a single cell can produce a variety of antibodies simultaneously or whether there must be a separate cell or clone of cells to synthesise each kind of antibody. Nossal and Lederberg [2] (the winner of a Nobel prize this year) used a micromanipulation technique to study isolated single cells from the lymph-nodes of rats immunised with two distinct strains of salmonella. Some of the isolated cells formed agglutinating antibodies to one of the strains and some to the other, but no single cell produced detectable amounts of antibody to both strains. It can be concluded therefore that when an animal is stimulated with two contrasting antigens, individual cells tend to form only one kind of antibody. Antibodies labelled with fluorescent dyes [3 4] have now been used to investigate the problem.[5]

Frozen sections of tissues suspected of containing antibodies to an antigen are first treated with the antigen and then with specific antibody coupled to a fluorescent dye. Cells containing the antibody will bind the antigen and then the labelled antibody so that they will show fluorescence when exposed to ultraviolet light. Two different modifications of the technique are used to detect the presence of two different antibodies. In the first modification the tissue section is first exposed to one of the antigens and the corresponding labelled antibody, and the distribution of fluorescent cells is noted. This fluorescence is quenched by exposure to long-wave ultraviolet irradiation. Then the section is treated with the second antigen, and fluorescent antibody and the distribution of fluorescence are again noted. The second method depends on labelling the two antibodies with dyes which fluoresce different colours, so that the presence of two antibodies can be detected simultaneously in the tissue section after treating it first with the mixed antigens and then with the mixture of antibodies each labelled with a different dye.

These methods have been applied to sections of spleen and popliteal lymph-nodes from rabbits immunised with mixtures of two different antigens, either pneumococci and hen-egg albumin or diphtheria toxoid and hen-egg albumin. In each case the immunisation caused proliferation of plasma cells and their precursors in the pulp of the spleen and the medulla of the lymph-nodes. Both methods revealed that the two antibodies were located within distinct systems of plasma-cell elements. In no case was evidence obtained of two different antibodies within the same cell—which confirms the view that individual cells tend to form only one kind of antibody.

If the two groups of cells forming different antibodies were derived by repeated division from widely dispersed precursors, there tended to be a characteristic grouping of

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the two kinds of cells. But although some tendency was discerned for some cells to occur in small clumps containing the same antibody, there were no marshalled clones of identical cells. This does not necessarily mean that there is no clonal individuation in antibody formation, since there is evidence of motility of cells in both spleen and lymph-nodes. In the case of germinal centres of lymph nodules there was some indication that the cells nearly all contained the same antibody.

THE MOSAIC MAKERS

GENERAL practitioners and medical statisticians are good companions indeed, for each has the means to supply the other's need. A practitioner's work consists of innumerable items of service or consultations which singly may mean little but in sum total represent an almost unexplored field for research. The statisticians, like the makers of the mosaics in Roman temples, are familiar with the management and handling of small bits and pieces, tiny fragments of information, and their methods can be applied to the doctor's material without difficulty.

Although attempts have been made in the past to fit the fragments of information gained in individual practices, and in small groups, into a useful picture, there have hitherto been no studies whose results can be related to a whole community. Such a study—appropriately a joint undertaking by the College of General Practitioners and the General Register Office—has now been made.[1]

The object of the survey was simple—to measure in total, and for each disease, the amount of sickness encountered in general practice in England and Wales in one year. The attainment of this object was more difficult since it required the recording of every item of service by 170 general practitioners in over a hundred separate practices during the twelve months of the survey. To ensure that the results represented conditions in the population generally, the sample examined had to be large; and to take account of the changes of the seasons the study had to be lengthy. In all, 382,829 patients were covered by the study, and records were made at 1,436,155 consultations with the family doctors. The mosaic had many pieces.

The diagnosis at each consultation was recorded, and from these diagnoses tables were prepared (in terms of the International Classification of Diseases) which show the numbers of patients attending their doctor for a given disease, as well as the number of consultations. The patient-consulting rate expresses the actual number of persons with a disease, and is the truest guide to the incidence of sickness in the community.

The main content of this volume, the first of a series of three, lies in the tables, which have been produced by mechanical analysis after coding and checking—itself a tremendous undertaking—of the cards completed by the doctors. These tables contain the most accurate and detailed information on the distribution of illness yet compiled for any community, and will be studied by administrators and others as a basis for planning. The fragments of this mosaic will be rearranged many times before all the possible pictures can be recognised and conclusions drawn from them; and the second and third volumes in the series will deal respectively with the distribution of sickness by occupation and with the more clinical implications of general practioners' morbidity statistics.

So the picture builds up, with doctor, people, diseases, items of service, geographical regions, and age-groups as the pieces. The tables show that during the year there was an average of 3·8 consultations per patient on the doctors' lists, and confirm the general impression that the common cold is the most widespread national affliction, with a patient-consulting rate of 81.1 per 1000. Bronchitis required most medical attention, with a consultation-rate of 261·1 per 1000. The rate of patients consulting for respiratory tuberculosis was 2·9 per 1000. The patient-consulting rate for psychoneurotic disorders was 45·7 per 1000—again confirming the impression of more frequent recognition of mental illness—and it is suggested that a national total of 2 million patients come under their doctors' care for conditions within this group at some time during the year. The number of patients consulting for cancer was 5·2 per 1000—a rate suggesting that about 230,000 cases come under general-practitioner care during a year; while arthritis and rheumatism were both widespread and disabling, having the second highest consultation-rates and patient-consulting rates.

A full account is given of the way in which this large survey was planned, showing the steps taken to ensure accuracy in recording and true relation of the morbidity seen by each doctor to the people for whom he was medically responsible. The background was the National Health Service "list", which itself changed in every practice, by births, deaths, and movements of the population during the survey year. The procedures for establishing the dimensions and age-sex structure of a practice population are described and will be valuable to all who plan future studies. It is noteworthy that one partner in this enterprise, the College of General Practitioners, is planning a modified survey to be carried out on a continued basis.[2] This is as great an evolutionary step as that from the still photograph to the "movie".

The modern mosaic makers have much to do, and much to learn as they do it. Sampling techniques must be developed and improved so that information of equal accuracy may be obtained for less effort and disturbance of general-practice routine. Methods of recording must be adapted to the special circumstances of general practice, and means must be found of presenting the information so obtained in its most convenient and useful form. The Survey now published is at once the foundation for future work and a challenge to future activity.

SEPTAL DEFECT IN FOWLS

THE Agricultural Research Council's Poultry Research Centre at Edinburgh maintains inbred lines of poultry, among which a number of unexpected lesions have emerged. One with a good deal of intrinsic interest, and some prospects of significance for human medicine, is the ventricular septal defect described by Siller.[3] 288 cases have been seen in the six Brown Leghorn strains affected, and in one strain 84% of birds were affected. A few of these were closed defects, and most were small, but about a third were substantial defects similar in degree to the average human case of *maladie de Roger*. Allowing for the differences in anatomy between the avian and the mammalian heart (not very great in the area concerned), the lesions, which are admirably illustrated, seem in all but one respect closely similar to the familiar human

1. Studies on Medical and Population Subjects. No. 14. Morbidity Statistics from General Practice. Vol. I (General). Pp. 174. H.M. Stationery Office. 15*s*. 6*d*.

2. See *Lancet*, Nov. 29, 1958, p. 1164.

3. Siller, W. G. *J. Path. Bact.* 1958, **76**, 431.

lesion. The one discordant feature is the presence in about two-thirds of the cases of valve-like lips which project from the edges of the defect. These seem not only to look like valves but to be capable of acting as valves, preventing the flow of blood from left to right through the defect. Birds with large defects without lips are stunted in growth, die young, and have greatly dilatated and hypertrophied left and right ventricles—evidence of a functional defect. Birds with lipped defects, on the other hand, show no clinical signs of disease, survive normally, and undergo right ventricular hypertrophy only late in life—equally clear evidence that the lips are effective in eliminating functional defect. These lips appeared to develop after hatching, and represent a most remarkable compensatory mechanism—one for which there is no parallel in man or indeed in any other animal. Sometimes the compensation goes further, resulting in actual closure of the defect by fusion of the lips.

As in man, bacterial endocarditis was common, especially in the older birds; it was found in 35% of birds over 6 months with septal defects.

Remote though they are for us in many details of anatomy and physiology, birds have been the subjects of many experimental studies of crucial importance. Eijkman's polyneuritic hens, the Rous sarcoma, fowl leukosis, Rawle's neural-crest transplantations, and the nephrotoxic sera manufactured by Masugi's ducks are examples of the profit to be derived from occasional avian excursions. It is more than possible that Siller's hens will prove equally helpful. The physiology of septal defect, the surgery of closure of the defect, and the therapy of subacute bacterial endocarditis might all find here a suitable experimental object. Perhaps also we should view with a less disbelieving eye the possibility of spontaneous closure of the lesion in man after birth.[4]

TRANSPLANTATION OF FŒTAL TISSUE

PATHOLOGY has recently been enriched by Prof. R. A. Willis's authoritative work on the Borderland of Embryology and Pathology.[5] Hard on the heels of this achievement comes the publication, after a gap of nearly twenty years, of a continuation of experiments designed to study the transplantability of embryonic tissues by intracerebral grafting in the same species.[6]

The host rats, four weeks of age, were not inbred and the grafted embryos were of other parentage and were not more nearly related than first cousins. Knowing that 12 mm. embryos gave successful grafts,[7 8] and that very early presomite embryos did not,[9] Willis used 6 mm. embryos. At the end of about two weeks, the overall rate of growth was about a third that of a normal embryo—an outstanding rate in the confined intracerebral space—but subsequently the rate declined, owing to crowding and to atrophy and degeneration of parts which had initially developed well. A notable absentee was the liver.

The successful tissues and organs in the grafts differentiated well and could be recognised as fully formed; gastric mucosa and two-layered muscle, pancreas, intestinal mucosa, kidney, and other organs were perfectly differentiated. Well-formed connective tissue, cartilage, bone, and the metacarpal and phalanges of a digit, with a cutaneous covering, were also obtained. All these tissues remained circumscribed and in their proper relationships, but cross-striated muscular tissue often grew invasively into other tissues—especially into the Virchow-Robin spaces in the nervous tissue of both the graft and the host's brain.

Professor Willis is not aware that this type of growth has been previously "observed of a normal developing tissue, though it is a familiar enough property of the cells of malignant tumours". Here indeed is a borderland between embryology and pathology which deserves further investigation, not only by studying the grafting of embryos of different ages under different conditions but also by the use of inbred animals. Cortisone and other hormones may affect the rate of growth and differentiation of these embryonic tissues.

4. Kjellberg, S. R., Mannheimer, E., Rudhe, W., Jonsson, B. Diagnosis of Congenital Heart Disease; p. 254. Chicago, 1955.
5. Willis, R. A. The Borderland of Embryology and Pathology. London, 1958. See *Lancet*, Oct. 18, 1958, p. 834.
6. Willis, R. A. *J. Path. Bact.* 1958, **76**, 337.
7. Willis, R. A. *Proc. roy. Soc.* B, 1936, **120**, 496.
8. Willis, R. A. *Aust. N.Z. J. Surg.* 1939, **9**, 119.
9. Willis, R. A. *Proc. roy. Soc.* B, 1935, **117**, 400.

THE RETREAT ADVANCES

THOUGH change is often necessary and decay may have its uses, a sense of continuity with the past can be very valuable to professions as to nations. In using the institutions, and sometimes the very buildings, created and made famous by our forefathers, we are continually reminded that medicine does not begin or end with our own generation, and that great things have been done by people who rose to opportunities that seemed small.

An example of the many historic and inspiring institutions that we in this country are fortunate in possessing is the mental hospital at York which shares with the Bicêtre in Paris the distinction of having introduced the humane treatment of the mentally ill. Founded in 1792 by William Tuke, and other Quakers, and still managed by the Society of Friends, it has continued in its original tradition, and has been a pioneer of much besides the friendliness and understanding which it has always tried to give its patients: it initiated, for example, organised training for mental nurses and was among the first in this country to employ women nurses for men patients and to abolish padded rooms. Remaining outside the National Health Service it is today a modern independent mental hospital with an average of nearly 250 patients in residence—only a tenth of whom are Quakers or connected with the society. In 1957 there were 392 admissions, and of the 368 patients discharged, 336 (over 90%) were described as recovered or relieved.[1] A relatively large staff—one doctor to forty patients and one nurse to two patients—allows of more personal attention than is, unfortunately, usual elsewhere.

Despite rising costs, and the hospital's practice of aiding patients who cannot afford its full fees, The Retreat remains economically sound, with surpluses sufficing for minor improvements and developments. But, like other hospitals with old buildings, it cannot possibly fit itself to meet all the needs of today without some fresh help from outside, and an appeal for £120,000 has therefore been opened, for general modernisation, for extending the laboratories, and for a new school for the nurses. To someone who wants to help people with mental disorder, either directly or indirectly, this scheme should have strong attractions; for the money is wanted to put fresh opportunities in the hands of a hospital which, in its quiet way, has already made medical history and is well placed to give a fresh lead.[2]

1. See the 161st annual report of the physician superintendent, Dr. C. C. Beresford.
2. Copies of the appeal may be had from J. Arthur Taylor, A.C.A., The Retreat, York.

Special Articles

MEDICAL ASPECTS OF ADOPTION

J. A. BLACK
M.D. Cantab., M.R.C.P.
ASSISTANT VISITING PHYSICIAN

FREDERICK H. STONE
M.B. Glasg., M.R.C.P. F.R.F.P.S.
CHILD PSYCHIATRIST

THE ROYAL HOSPITAL FOR SICK CHILDREN, GLASGOW

RECENT clinical experiences lead us to believe that there are still grave defects in adoption practice, and that they often stem from a failure to apply well-established principles of modern medicine, especially of pædiatrics, genetics, and psychiatry.

In all adoptions made through official societies or local authorities, both the applicants and the child are medically examined; but this is not necessarily done in the many direct and third-party adoptions.

The Child

Examination of the child is far from easy. Now that adoption is taking place at an earlier age than previously, the doctor needs considerable experience and judgment. An older child is to some extent his own witness as to his normality, and the assessment of the mental and physical state of a child of 4 years or more is usually relatively simple; but the assessment of the young child or infant presents greater problems.

Often the past history is extremely scanty and would not be considered adequate as a routine medical history at any children's hospital. This is partly because many of the forms used are inappropriate for infants. Here the history of the developmental stages is of great importance, as are the details of the delivery and behaviour of the baby immediately afterwards and during the neonatal period. But often such information is not available at all.

Family History

Again, the proper assessment of the child is incomplete without his family history. Admittedly the father is rarely available for interview or examination, but whenever possible information should be obtained about the mental and physical health of the parents, their intelligence, consanguinity, and the presence of any genetically determined condition in the family. Sometimes, as the following case shows, failure to note an abnormal family history may lead to difficulties which could have been avoided.

Case 1.—AB was referred to a pædiatric clinic at the age of 8 months as she was not yet sitting up. She was a hypotonic infant who did not appear to appreciate light and did not follow objects. The pupils reacted to light and the discs appeared rather pale but were probably within normal limits.

She had been accepted for adoption at the age of 1 week, but the adoption had been suspended because she had not developed normally. The adoptive mother had already legally adopted her elder brother, whose development was satisfactory.

A letter to the children's officer of the area where she had been born produced a report that the child's delivery had been normal and that no abnormality had been suspected at the maternity hospital.

In view of her retardation, the adoptive parents were told that she was going to be very backward mentally and that it was not at all certain whether she could see normally. It was pointed out that though the child would be a considerable burden on them, there was no reason why they should not legally adopt her, if they wished to do so. They were, however, advised to give the matter a great deal of thought before taking such a step. She was seen at intervals during the following year, and it became clear that she was making little progress mentally or physically. At 1½ years she was unable to sit up, but would grasp objects feebly if they were placed near her hands. There appeared to be some vision but she took little notice of objects or people. An air encephalogram showed a large subarachnoid space with a very small brain.

The children's officer now advised that the adoption should be stopped and offered to take her back to a children's home. The adoptive mother was upset at this idea and said that she had become attached to the child, but felt that she and her husband could not provide all the care and attention that would certainly become necessary as the child got older. Finally the child was returned to the care of the children's department.

A second report was then received from the children's officer, giving the family history (which had not been available before). The father was unknown but the mother was certified as a mental defective shortly after the child's birth. She had two older children, both illegitimate, one of them a little above average in intelligence, the other a little below average. The mother had a sister who was mentally subnormal, but not certified as defective. The two girls were children of the maternal grandmother's first marriage. By her second marriage, she had five children, two of whom were educationally subnormal, and a third of whom suffered from an ataxia.

This case brings out a number of important points:

The child was placed for adoption too early for a medical examination to be of real use in assessing her mentality.

With such a family history extra care should have been taken in examining this child before placement for adoption.

It was probably assumed that the child would be normal because her elder brother had turned out to be normal.

The final result was very distressing to the applicants.

Many hereditary conditions may be detected or excluded by suitable tests in early infancy if they are suspected because of the family history (e.g., acholuric jaundice, hæmophilia, and some forms of congenital deafness). Other genetically determined diseases may not be detectable by any test for many months (e.g., gargoylism) or years (e.g., otosclerosis, Friedreich's ataxia) and great caution should be exercised in placing for adoption infants or young children from affected families.

The physical examination of the infant should include an estimate of the stage of neuromuscular coordination and an examination of the optic discs. In any child over the age of 6 weeks tests can be used to exclude gross degrees of visual or auditory defect. Some important conditions, though not immediately obvious in the early weeks or months, can be detected by simple tests. Thus, the abduction test may reveal cases of dislocated hips which would otherwise have remained undetected for many months. There is seldom any real difficulty in obtaining specimens of urine from young infants, and it is important that the examination of the urine should not be omitted because the simple ferric chloride test will detect cases of phenylpyruvic oligophrenia, while the presence of a reducing sugar in the urine may lead to the diagnosis of galactosæmia. Albuminuria in a young infant usually indicates a gross infection due to a congenital abnormality of the urinary tract, or (very rarely) nephrosis. Cardiac murmurs are often found during the neonatal period. Many have the characteristics of an organic murmur, but may disappear completely after a few weeks. Such murmurs are often difficult to distinguish from the persisting murmurs due to organic disease, but the presence of a murmur without other evidence of cardiac disease should not immediately exclude a child from adoption. Further examinations will probably be necessary before a firm diagnosis can be made.

Mental Abnormality

The early diagnosis of mongolism is often easy, but in a few children the decision must be delayed. Most children offered for adoption are illegitimate, and the illegitimate child is more likely to be born prematurely than the child born in wedlock (Anderson et al. 1941,

Drillien and Richmond 1956). Special care must be taken in the acceptance of children of low birthweight, for the incidence of mental defect and cerebral palsy rises steeply in the groups with a birthweight under 4 lb. (Knobloch et al. 1956, Andersen 1957, Drillien 1958).

Case 2.—CD was adopted at the age of 5 weeks. The mother said that she was assured by the adoption society that she was a healthy child and had had a normal birth.

The adoptive mother was not unduly disturbed by any physical retardation until at 9 months the child had a severe convulsion, which lasted an hour. However, even before this convulsion she had been unable to sit without support and was rather clumsy and slow in using her hands. She sat up at 12 months and crawled at about the same time. She always drooled a lot and did not speak until the age of 4 years.

At 4 years 9 months she was referred to the screening panel of a school for children with cerebral palsy. Full particulars of the birth were then obtained from the hospital where the child had been born. The hospital reported that the mother had been admitted in labour, because of delay in the second stage and fœtal distress. No evidence of fœtal distress was found in hospital and the child was delivered by an easy low forceps under spinal anæsthesia. No resuscitation was needed, but the child had head retraction and appeared to be "cerebral". Chloral was given. At 10 days the child went home, apparently well. The birthweight was 8 lb. 9 oz.

The opinion of the screening panel was that the child had a spastic quadriplegia. Intelligence testing was difficult because of lack of speech, but she appeared to be below normal intelligence. 4½ years later she was seen again and the opinion was confirmed that she was feebleminded.

This child was placed at a very early age with the adoptive parents who were told that she was going to be normal. It is possible that the neurological abnormalities might have been undetectable at this age, but in view of the birth history there was need for caution. The adoptve parents should have been warned of the possibility of cerebral damage.

In view of the considerable publicity being given to techniques for assessing the psychological status of infants, it is important to clarify the scope of these procedures. In doubtful cases, the opinion of a psychologist may be a great help, but only if the psychologist has been specially trained in infant assessment. The estimated score of the baby's status and the developmental quotient are dependent not only on innate intelligence, but also on the integrity and degree of maturity of the central nervous system, as well as on environment. The developmental quotient should not be regarded as an accurate prediction of ultimate intelligence.

It is particularly tragic when a couple, having elected to adopt an older child, often at the toddler stage, in order to reduce the risk of undetected abnormalities, later learn that it has a severe psychological disturbance.

Case 3.—EF, age 8 years, was referred for a psychiatric opinion by the educational psychologist because his school reported that he was disobedient, unable to concentrate, and learning almost nothing. His I.Q. was 80, which though placing him in the dullard category could not explain his total scholastic failure. The boy was adopted at the age of 1 year and 10 months. His birth was illegitimate and he was reared in first an infants' home and later a toddlers' home. His natural mother had contact with him only till he was 6 months old. Though the adoptive parents had been assured that the child was lively and healthy, there were troubles from the start. The child was so restless that he could be fed and bathed with only great difficulty. As the weeks passed, there was concern about the child's distractibility and lack of any real affectionate response. He was about 3 years old before he pronounced words, and by the age of 4 he had become a serious problem in the family. He was destructive in a purposeless fashion, continually seeking attention, yet indiscriminately "friendly" with anybody, and showing no evidence of shyness.

The child was found to have a profound disturbance in personality development unlikely to respond to treatment even with long-continued residential psychiatric care. This could not be explained as a reaction to disturbed family relationships, but was most likely the outcome of emotional deprivation in infancy.

The pathogenic role of this kind of early history, and especially the absence of an early, continuous, affectionate relationship with the mother or mother-substitute is now recognised (Bowlby 1951), and unfortunately illegitimate children begin their lives in this way. A physician entrusted with screening candidates for adoption should be thoroughly familiar with this type of child, and should not be misled by their superficial attractiveness and the quick rapport which is usually established.

Another syndrome of disordered behaviour, though it superficially resembles that just described, has a very different pathology. The hyperkinetic child is a brain-damaged child who may show no evidence of cerebral palsy, epilepsy, or gross mental defect but yet displays clear signs of cerebral dysfunction (Ingram 1956).

It is hyperactive and distractible. Its next move is generally unpredictable. It shows no reserve on contact with strangers. It may have defects in perception, and a poor capacity for abstract thought. In infancy there is often a history of disturbance of motility and sleep rhythm, but it is at the toddler stage that the picture reveals itself in unmistakable form, and such a child is likely to test the stamina and patience of the most sympathetic parent.

The Need for Information

The aim of the medical examination of the child should be carefully considered. It is scarcely enough to ensure only that at the time of examination the child is fit and well. Most applicants would surely wish to know whether there is any likelihood that the child will later prove to be mentally defective or to have a cerebral palsy, or will develop some serious hereditary disorder. We do not agree with the point of view implied by the Hurst Committee (1954) when they quoted the following:

"Some social workers hesitate to recommend for adoption any children but those whose heredity and background will bear close scrutiny, whereas the truth is that no child, whatever his origin, can be guaranteed to fulfil the hopes and aspirations of his parents. If the adopting parents are themselves suitable, and if all the known facts about the baby have been set before them and they are prepared to accept him, let the adoption go forward. All parenthood involves a risk."

Adoption is not exactly analogous to normal parenthood, when both parents usually know a great deal about each other's family backgrounds and health. If there is a hereditary or potentially hereditary disorder on either side of the family, a husband and wife can seek expert advice on the advisability of having children; similarly when one child has been born to a couple and has been found to have a genetically determined condition, then the likelihood of other children being affected can be estimated to some extent. In an adoption the situation is different and the assessment of the likelihood of an infant developing such a condition is left largely to the local authority or adoption society. This decision is often difficult and is certainly one for an expert.

Were we ourselves applicants we would feel entitled to know that an adequate family history was available for scrutiny by a competent authority, and that a full physical examination had been made, giving due regard to the type

of delivery and the later development of the infant. We might be perfectly willing to proceed with the adoption even if some physical or mental abnormality were present, provided we were given a frank and authoritative appraisal of its implications.

The Applicants

Examination of the applicants is intended to ensure that they are unlikely to endanger the health of the child from communicable disease, and that they are not suffering from any condition likely to prove incapacitating or fatal before the child reaches independence. Even at this relatively crude level the examination is less stringent than that required by most immigration authorities. As recently as 1954 the Hurst Committee suggested that radiological examinations of the chest should be included only if thought desirable; yet it is a clinical fact that pulmonary tuberculosis cannot be excluded by physical examination. Now that mass radiography is a commonplace, it is unlikely that applicants would be afraid to have their chests X-rayed, and would therefore try to avoid the procedure of a legal adoption.

If the physical screening of the applicants is often inadequate, even more so is their psychological assessment.

Case 4.—GH, aged 6 years, was referred to the child psychiatrist with evidence of persistent nocturnal enuresis, restlessness, nail-biting, and temper tantrums. He was an only child, and had been adopted at 3 weeks. As a baby he had suffered from eczema, and until the age of 5 years had had "wheezy bronchitis" each winter. He had not been told he was adopted, yet he often begged not to be sent away. He was still wearing napkins at night, and during his adoptive father's frequent absences from home on business he slept with his adoptive mother, who remarked, "But I always sleep with my back to him". She also spoke of the child's own mother, describing her as healthy but nervous. It transpired that on the day of adoption the child's mother handed over the infant to the adoptive mother in the presence of the matron of the baby home. Indeed, the two women drove off in the same car, and have since kept up regular contact.

The boy was found to be suffering from an emotional disorder which untreated would certainly have progressed to a psychoneurosis. He was given intensive psychotherapy and during this time the adoptive mother was helped by casework interviews to understand the child's needs. This met with only limited success, for she was found to have a severe personality disturbance with many neurotic features—e.g., she had little or no insight into her own feelings, suffered from marked memory-blocking and irrational fears, and during much of the time was living in fantasy in her own childhood in England. On one occasion the child told a neighbour that his mother really wanted to have a daughter, a fact which she confirmed. The adoptive father proved to be a rather colourless and very inhibited man who constantly indulged the boy. His wife described the marriage as "empty". The child attended for psychotherapy weekly for 13 months, by which time there had been complete disappearance of the enuresis and fears, and an obvious lessening of the hyperactivity.

It might readily be thought that the genesis of the child's psychological illness was to be found in the extraordinary circumstances of the adoption and the situation between the adoptive mother and the child's own mother. In fact, this proved to be of small significance compared with the adoptive mother's own psychiatric condition. There can be little doubt that this woman would have had a disturbed relationship with a natural son.

The adoption here described was so ill advised as to be scarcely credible, and it is a sad reflection on the present state of affairs that it could happen. The psychological assessment of any couple as adoptive parents is far from easy, and present knowledge about pathogenic family relationships is incomplete. Nevertheless when we are given the task of matching a child and parents it is surely reasonable to reject as unsuitable a husband or wife whose capacity for normal human relationships is defective, whether as a result of neurosis or of a personality or character disorder. As such people may be intelligent, charming, economically successful, and, by conventional standards, good citizens, their assessment is clearly a task for an expert.

Often the examining doctor has apparently approved of very unsuitable motives for wishing to adopt a child. We must reject outright the widespread notion that to have a child, natural or adopted, is a certain cure for female neurosis.

Conclusions

The medical aspects of adoption procedure might be improved in a number of ways. The information about the child's parents is sometimes inadequate because the family doctor is unwilling to give confidential medical information to a children's officer or to a non-medical committee. This situation might be avoided if the case committee always included a doctor whose training and experience would fit him to assess the medical information and interpret it to the rest of the committee. Where there is no committee a suitably qualified doctor should be available to advise the children's officer or adoption society.

When the child appears normal at examination but has suffered from fœtal distress or neonatal asphyxia, one cannot say whether evidence of brain damage may appear later. In such a case the applicants should be told of all the circumstances and should be advised against making the adoption final until after a further examination. We are concerned at the frequency with which infants are placed with the applicants before 6 weeks have elapsed from birth. It has been clearly laid down that the mother cannot legally consent to the placement of her child for adoption until the child is 6 weeks old. We know of many instances where a child has been placed at the age of 2–3 weeks on the strength of the mother's verbal consent, only to be returned to the mother's care when she decides against giving it up. Such changes may not harm the child if they occur within the first few weeks of life, but they may create emotional difficulties in the adopters which could prejudice the success of the adoption of another child. Also, it is impossible to give a fair estimate of the development of a child aged only 2–3 weeks, and a later examination is always advisable.

The examination of a child for adoption is a highly skilled procedure and should be undertaken only by a doctor with the skill and experience necessary to enable him to assess the child's present state and also the likelihood of any abnormality developing later. If a child is clearly going to be handicapped, this is not necessarily a bar to adoption, but the doctor should be able to give the applicants as accurate and authoritative a prognosis as possible so that they may know all the facts before deciding to proceed with the adoption. Sometimes it may be necessary to seek specialist advice on an unusual or complex condition.

Similarly, in the examination of the applicants, special skill in interviewing is needed and sometimes the help of a psychiatrist or psychiatric social worker may be invaluable.

Although there are a number of useful books on the subject, we have been unable to discover any short, clear,

and informative statement suitable for the public. It is long overdue.

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TBTING OF AIR-FILTERS FOR HOSPITAL STERILISERS

H. M. RICE
M.D. Lond.

RECTOR, DEPARTMENT OF PATHOLOGY, GENERAL HOSPITAL, NOTTINGHAM

HSPITAL sterilisers and their correct use have been the subjcts of important publications during the past three year (Alder and Gillespie 1957, Bowie 1955, Howie and Timury 1956, Kelsey 1958, Perkins 1956, Scott 1957). Mos of these authors mention the importance of air-filte: in preventing the recontamination of sterilised gooc during the drying period.

Te need for efficient bacterial filtration of air admitted to strilisers of the autoclave type, for the purposes of dryig or of cracking the vacuum, is in fact widely recognisec without filtration, pathogenic bacteria may be aspirted right into the sterilised contents of packs and drums. But there is as yet no general agreement on the type and limits of tolerance of the filter required.

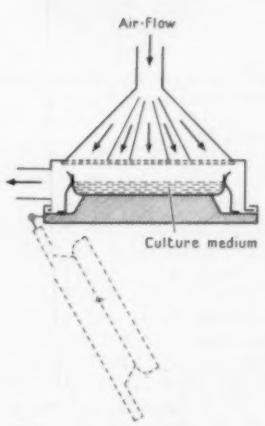

Fig. 1—Sectional view of filter-testing unit. Petri dish, containing culture medium, is held in spring-clips. The base of the unit is hinged to allow insertion and removal of the petri dish.

One of the difficulties in deciding these two important points has been to test filters when they are actually connected to functioning sterilisers. Working from a suggestion of mine, Mr. J. M. Hodges, of Manlove, Alliott & Co., has designed and manufactured a piece of apparatus which permits the testing of such filters under their normal working conditions. The principle is very simple.

The air from the filter-inlet is led through copper piping to a chamber in which it impinges on the face of a bacteriological culture plate (fig. 1). The air is then ducted from the test chamber into the autoclave itself. A bypass is provided, with the necessary valves, so that the test chamber may be excluded from the air-line, if desired (fig. 2). The inlet to the test chamber is so arranged that incoming air is spread over the whole surface of the culture plate, and not confined to a small

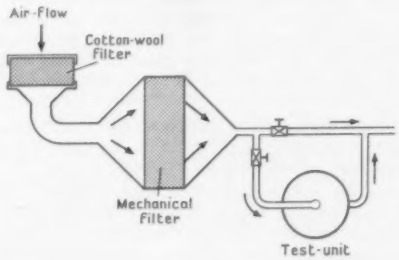

Fig. 2—Layout of filters and testing unit. The air may be made to pass through the test-unit or bypass it by means of the valves.

area opposite the inlet pipe. Our apparatus * is made to hold, in spring-clips, a standard $3^1/_2$ in. petri dish: but the size may be varied.

We have found no difficulty in the handling of the culture plates, and accidental contamination from the atmosphere can be avoided, if the lid be kept on the dish until the moment when the dish is placed in its retaining clips. The apparatus has been used on many occasions, and has proved entirely satisfactory.

The type of air-filter to be used has been the subject of a series of experiments. Filters of the candle type have been shown to be ineffective. Non-absorbent cotton-wool, if packed to the correct density and changed daily, is usually considered to be the most effective filter available. There is, however, now on the market an air-filter using a special glass-paper medium in folded form, and rated to maintain a penetration of less than 1 part per 100,000 at the critical 0·3 micron range.† It was considered that this type of filter might well be used for hospital sterilisers.

Experiments have therefore been conducted to demonstrate:

(1) The potential risk in unfiltered air.
(2) The efficacy of a cotton-wool filter.
(3) The efficacy of the Vokes filter.

All the experiments reported were made on a modern high-pressure high-vacuum steam steriliser of 5 cu. ft. capacity, using a vacuum of $29^1/_2$ in., and a chamber pressure of 30 lb. per sq. in.

Methods

The steriliser under test was housed in a workshop where it was, of necessity, exposed to draughts and dust. Atmospheric contamination of the test-plates seemed very likely, so a check-plate was simultaneously exposed each time a test-plate was put into or taken out of the test apparatus. A second series of check-plates was similarly used during the exposure of the test-plates at the bacteriology bench.

In the event, it was found that as the operators gained experience, the check-plates from the workshop showed much less contamination. Those exposed in the laboratory never grew more than an occasional colony.

It was therefore considered that organisms growing on the test-plates must either (1) have passed through the filters, thus proving them to be inefficient, or (2) have been present in the air-line before the tests were made. To guard against the second possibility, a check run, or blank, was made before every experiment: further, the packing material used for sealing the joints in the piping was cultured.

* Provisional patent no. 25871/58.

† This filter is manufactured by Vokes Ltd., of Guildford.

To ensure a high degree of contamination of the air to be filtered, hospital blankets in ward use were shaken over the air-inlet during the vacuum-release period in all experiments. This method has been used for a number of years to demonstrate airborne contamination and, in my experience, has never failed.

All culture plates were incubated both aerobically and anaerobically (24 hours each) before the results were assessed. Blood-agar was the medium used throughout.

The steriliser is provided with a glass chamber, $1^1/_2$ in. in internal diameter, and 4 in. in height, at the air intake. This chamber is designed for the use of cotton-wool as an air-filter, and was filled with fresh, sterile, non-absorbent cotton-wool each day. If packed finger-tight, but not jammed as full as possible, the cotton-wool was visibly compressed further when the vacuum was released. The possibility of a standard pack, in cartridge or wad form, has been considered.

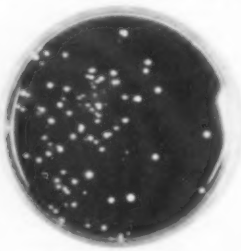

Fig. 3—Culture plate from unfiltered air, deliberately contaminated. Approximately 80 colonies present.

Results

Experiment 1: To demonstrate the bacterial contamination of unfiltered air.—In the absence of cotton-wool or any other filter, the bacteria released on shaking a blanket over the air-intake at vacuum-release, impinged unhindered on the culture plate. Approximately eighty colonies of mixed staphylococci, micrococci, chromogenic bacteria, and organisms of the subtilis group were grown (fig. 3).

Experiment 2: To exclude joint-packing material as a source of contamination.—The packing material was ground up in sterile saline and spread freely over culture plates. A few coliform organisms, only, were grown. Such organisms were not found during the other tests.

Experiment 3: Efficacy of the Vokes filter plus cotton-wool.—The Vokes filter was fitted in the air-line so that air passed first through the cotton-wool and then through the Vokes filter, before impinging on the surface of the test-plate. Throughout the vacuum-release period a blanket was shaken over the air-inlet. Plates gave no growth in repeated experiments. Fig. 4 shows one such experiment, chosen because both workshop and laboratory check-plates showed definite contamination. In other experiments the degree of contamination was very much less. It was concluded that the Vokes filter plus cotton-wool forms an efficient bacterial filter.

Experiment 4: Efficacy of the Vokes filter alone—Under exactly similar conditions, but without cotton-wool in the container, the Vokes filter produced sterile test-plates. On each occasion the check-plates showed single colonies. It was concluded that the Vokes filter is bacteriologically satisfactory (fig. 5).

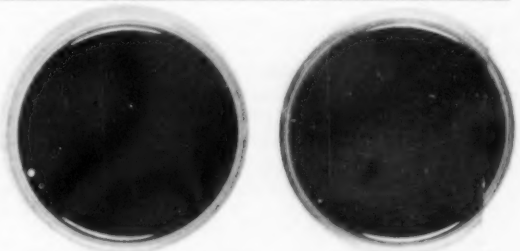

Fig. 5—Test of Vokes filter alone. Single colony on works check-plate (left): test-plate sterile.

Experiment 5: Efficacy of cotton-wool, as a filter.—The Vokes filter was removed from the air-line, which was reconnected. Experiments, in duplicate, were made, using the cotton-wool filter, only, packed finger-tight with sterile, non-absorbent wool. Sterile test-plates were once more obtained, the check-plates again showing occasional colonies of airborne contaminants. It was concluded that the cotton-wool filter was efficient (fig. 6).

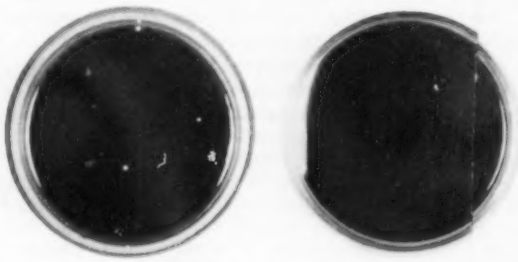

Fig. 6—Test of cotton-wool filter alone. The works check-plate shows three colonies (left): the test-plate is sterile.

Discussion

These tests confirm that an adequate cotton-wool filter will efficiently exclude bacteria from sterilisers when the vacuum is released. Is any other type of filter necessary? In my opinion, yes: purely because of human falibility. To be effective, cotton-wool filters must be changed frequently, preferably at the beginning of each sterilising session. Since the air of sterilising rooms is always moist, only non-absorbent wool should be used. Damp wool will not pass air adequately and may, if left long enough, permit organisms to pass through it. Lastly, the correct tightness in the packing of the wool must be maintained. Until and unless some prepacked standard wad becomes available, the packing of the filter-chamber depends on the individual operator. In our experience, a column of wood 3 in. long, and packed finger-tight, is adequate. Such a column becomes further compressed when the vacuum is released. It forms a considerable

Fig. 4—Culture plates using Vokes filter plus cotton-wool. Series chosen to illustrate, from left to right, laboratory check, workshop check, and test-plate. This degree of contamination of the check-plates was exceptional.

barrier to the passage of air, and approximately doubles the time for the vacuum discharge (3 minutes against slightly less than $1^1/_2$ minutes on the test steriliser). The cotton-wool must be sterilised before use, or contained bacteria and spores may be aspirated into the steriliser chamber.

Because of the possible improper use of cotton-wool filters a second, mechanical, filter is advisable. The Vokes filter has been shown to be efficient. Possible objections to it are price, the necessity for periodic renewal, and the difficulty of ensuring precisely when it ceases to become effective. The life of these filters is not yet known, but is probably of many months. We are keeping a log of all tests run through our present instrument to determine it. Most mechanical filters cease to be effective when they become clogged up, so that air-passage is greatly delayed: or when the packing cracks or shifts so that air passes more rapidly. The model used passes 3 cu. ft. of air per min. Large-chamber sterilisers will, therefore, require either larger filters or batteries of smaller ones.

The use of a cotton-wool filter in addition will prolong the life of the Vokes filter, and will also safeguard against possible mechanical failure. Price should not preclude the use of such a valuable piece of equipment.

There seems to be a strong argument in favour of the use of the air-sampling apparatus with all modern steam sterilisers. Without some such testing, it is impossible to check that bacteria-free air is being supplied to the sterilisers: and to sterilise dressings, for example, only to expose them to the risk of contamination on releasing the vacuum is a practice wholeheartedly to be condemned.

Summary

In experiments with a simple device for testing air-filters for use with steam-sterilisers, air was deliberately contaminated by shaking an infected hospital blanket over the air-inlet during the period of the vacuum-release. Tests, using a modern high-pressure high-vacuum steam steriliser, showed that filters of sterile non-absorbent cotton-wool are bacteriologically effective. Because of possible human error in their use, a mechanical filter is also desirable. The Vokes filter has been shown to be bacteriologically satisfactory.

Reasons are given for using both cotton-wool and Vokes filters in series.

Unless bacteriological tests are made, it is impossible to ensure that bacteria-free air is supplied to steam sterilisers when the vacuum is released.

I wish to thank the directors of Manlove, Alliott & Co. for their collaboration in this work: and particularly Mr. J. M. Hodges, M.I.MECH.E., who designed the testing apparatus and who gave me much personal assistance throughout the experiments. I am most grateful, too, to Mr. F. C. Rowan, F.I.M.L.T., and Mr. C. A. Durrant, F.I.M.L.T., for their help with the bacteriological investigations.

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HOSPITAL BEDCLOTHES

OUR attention has been drawn to certain inaccuracies in our description of bedclothes recently tested at the London Hospital (Oct. 4, p. 743). We are glad to publish the following amended information:

Pillows

'Terylene' pillows can be immersed in hot soapy water when they need cleaning. It is possible to sterilise them by autoclaving, though this has not yet been done at the London Hospital.

Pillows filled with foam-rubber have not been immersed in disinfectant, and the manufacturers believe that this would ruin the foam-rubber. 'Dunlopillo' pillows are very soft and can be used as top pillows. Those filled with foam-rubber pieces are much cheaper, and they are suitable for use underneath, or for supporting the patient in a particular position.

'Jaconet' pillow covers are an old type of protective covering which wears out very quickly, and which will not stand frequent washing. A new type of cover, made of fine, soft, plastic material, appears to wear better and is cheaper.

Drawsheets and Mattress Covers

'Playtex' sheets cover only the drawsheet area and not the whole mattress.

When plastic mattress covers are used they are cleaned by washing with soap and water. Because of the possibility that plastic materials may set up a high-voltage reaction if two large surfaces rub together—for example, when an oxygen tent with plastic curtains is used—they are not yet being introduced.

Blankets

The confusion over the names for cotton blankets has already been discussed in our columns (Oct. 25, p. 907; Nov. 1, p. 962) and the makers have pointed out that, according to the terminology of the trade, the blankets used at the London Hospital are of terry towelling with a special pattern of indentations in the weave.

Public Health

Mass-Radiography Campaign in Liverpool

A MASS-RADIOGRAPHY campaign is to be held in Liverpool between Feb. 23 and March 21.

Responsibility for the campaign rests jointly with the regional hospital board and the city council, the council providing publicity, propaganda, accommodation for the units, and incentives for people to be X-rayed, and the board being responsible for the provision of the units, accommodation and welfare facilities for the staffs of the units, setting up operational and sector headquarters, and arranging for the actual X-ray examination of the people and for the treatment of cases discovered.

Thirty units will take part, four of these being the board's own units, nineteen coming from other boards in England and Wales, and seven coming from Scotland. For operational purposes the city will be divided into five sectors; the units will be located in church halls, corporation clinics, and departmental stores, &c., and sessions will normally be held from 2 to 4 P.M. and 6 to 8.30 P.M. each day except that in the departmental stores they will probably be held from 10 A.M. to 5 P.M.

The target of the survey is to X ray 400,000 people, although it is hoped to exceed this figure. It is estimated that £59,000 will be required to cover the board's share of the campaign.

Infectious Diseases in England and Wales

Disease	Week ended November				
	1	8	15	22	29*
Diphtheria	6	6	6	9	7
Dysentery	551	626	614	747	1098
Encephalitis:					
Infective	2	1	2	4	4
Post-infectious	2	2	1	2	—
Food-poisoning	205	392	196	247	236
Measles, excluding rubella	5014	5318	5793	6112	6910
Meningococcal infection	17	21	18	18	16
Ophthalmia neonatorum	15	18	28	21	26
Paratyphoid fever	5	4	3	9	5
Pneumonia, primary or influenzal	316	294	309	369	407
Poliomyelitis:					
Paralytic	54	59	50	47	50
Non-paralytic	25	23	16	25	19
Puerperal pyrexia	237	189	197	189	184
Scarlet fever	889	917	978	1089	1164
Smallpox	—	—	—	—	—
Tuberculosis:					
Respiratory	503	498	480	457	480
Meninges and C.N.S.	5	6	3	9	2
Other	51	63	79	59	63
Typhoid fever	4	5	3	3	3
Whooping-cough	637	643	805	758	724

* Not including late returns.

Conferences

TUBERCULOSIS

AN International Symposium on Tuberculosis, sponsored by the Deborah Sanatorium and Hospital, was held in Philadelphia on Nov. 20–22. It took the form of a series of panel discussions. The individual panels were constituted from the following invited members:

Drs. Oscar Auerbach, Theodore L. Badger, Katharine R. Boucot, J. Maxwell Chamberlain, Paul T. Chapman, Aaron D. Chaves, David A. Cooper, Louis Reis Davidson, Roberts Davies, Nicholas D. D'Esopo, Israel George Epstein, Floyd M. Feldmann, Seymour Froman, Michael L. Furcolow, Julia M. Jones, Edith M. Lincoln, Walsh McDermott, Gardner Middlebrook, Carl Muschenheim, James E. Perkins, Sidney Raffel, James W. Raleigh, Edward H. Robitzek, L. H. Schmidt, George N. J. Sommer, Jr., John D. Steele, William Steenken, Jr., William B. Tucker, William M. Tuttle, Julius Lane Wilson, and Guy P. Youmans (U.S.A.); Drs. Hugh E. Burke and Frederick G. Kergin (Canada); Dr. Georges Canetti (France); Prof. Carl Semb (Norway); Dr. Johannes Holm (World Health Organisation); Drs. J. R. Bignall and Philip D'Arcy Hart, Mr. F. Ronald Edwards, and Prof. J. M. Robson (Great Britain).

Chemotherapeutic Prophylactic Measures

The necessary distinction was drawn between methods designed to prevent multiplication of the infecting bacilli (" primary prophylaxis ") and those aimed at preventing clinical and radiographic manifestations from appearing (" secondary prophylaxis "). The discussion centred on the use of isoniazid alone, and dealt with the results of laboratory experiments with small animals and monkeys together with the few planned studies so far carried out in man. There appeared to be almost general agreement that in certain " high-risk " groups with known recent exposure to tuberculous infection, administration of isoniazid was desirable for a few months—the probable incubation period of the disease—followed by vaccination with B.C.G. The possibility of using a vaccine from attenuated isoniazid-resistant strains was discussed.

In the more difficult question of treating infected individuals once tuberculin skin sensitivity had developed without other manifestations, the possibility of impeding the development of immunity by too early treatment was considered. In general, it appeared to be thought that immunity had probably reached its full development once tuberculin skin sensitivity had appeared and that treatment with isoniazid at that stage would not necessarily abolish it. A reasonable approach seemed to be to treat those, especially infants and adolescent children, who were known to have recently acquired skin sensitivity; this should not be a general rule, but each case should be considered individually with regard to such factors as environment and likely cooperation. There was something to be said for not extending such treatment beyond these groups until the results of further studies were known—those, for instance, being carried out by W.H.O. on tuberculin-positive individuals of all age-groups. There did, however, appear to be a case for paying attention to the size of the skin reaction, as it had been clearly demonstrated that morbidity was higher in those found on first testing to have large reactions than in those with small ones. It could not be denied that resistant strains of bacilli might subsequently emerge in a few people treated " prophylactively " in this way, but there were good a-priori reasons for thinking that this would be a very rare happening, because of the small, sluggishly dividing bacterial population in such cases.

Chemotherapy of Manifest Disease and Hospital and Home Care

For patients without symptoms or signs of " active " disease there was uncertainty about whether drug treatment should be given in all cases. It seemed better to make the decision in the light of the individual circumstances of the case. Combinations of drugs were generally considered desirable; but a case was put forward for using isoniazid alone, at least in those with minimal or moderately advanced disease (N.T.A. definitions), and after the sputum had become negative and cavities closed. Further studies of this, now in progress, should give much-needed facts. Despite its disadvantages (concerning the magnitude of which there appear to be considerable differences of opinion) *p*-aminosalicylic acid remained a necessary drug, particularly in combination with isoniazid for oral administration. There was no " universally applicable " combination, and the drugs should be chosen with regard to sensitivity of organisms, type of lesions, form of treatment planned, and the personality and environment of the patient. High dosage of isoniazid seemed to be required for only a small proportion of cases. It was agreed that all the drugs should be given daily for initial treatment, and not intermittently. Treatment should continue for at least a year, subsequent treatment depending on the initial type and extent of disease. The optimal duration in any defined set of circumstances had not, however, been so far determined. Corticosteroids were probably valuable for some severely ill patients, but further controlled studies were required before they could be recommended in less severe cases.

There was wide divergence of opinion about the best combinations of the " secondary " drugs to be used in patients with cultures resistant to all three of the commonly used ones—reflecting the paucity of facts on this subject. There appeared to have been a general movement of opinion towards greater elective use of home treatment. The effectiveness of treatment out of hospital seemed to depend largely on the cooperation of the patient and the skill of the physician, rather than on the particular combinations and dosages of drugs. An important factor, at present little considered, was the regularity with which the patients took their drugs. All aspects of this should be more fully investigated. There also appeared to have been a well-marked change of opinion about the necessity for bed rest; and it was agreed that rest now played little part in the successful treatment of many patients.

Relapse

There was some difficulty in defining what should be called a " relapse ". The panel could not be drawn into giving figures for the proportion of patients under treatment who excrete resistant organisms after becoming temporarily sputum-negative; and they seemed reluctant to call this a " relapse ". Some considered that the rediscovery of tubercle bacilli in the sputum was a necessary criterion for purposes of study, but this was clearly not essential in clinical practice. There was some disagreement whether the bacilli recovered in relapses after chemotherapy had been discontinued were more commonly drug-sensitive or drug-resistant.

The effect of host factors on bacterial persistence and relapse was discussed. Experimentally it had not so far been possible by corticosteroids or other means to

produce relapse in animals with latent infection brought about by treatment with pyrazinamide and isoniazid. No evidence (as opposed to opinions) was forthcoming of the value of resecting tuberculous lesions compared with prolonged drug treatment in preventing relapse. Exogenous reinfection could theoretically occur after successful treatment of tuberculous patients; but no facts could be given about its actual occurrence. Infections by " atypical " mycobacteria (" para-tubercle bacilli ") were discussed, and it was emphasised that laboratories should be more aware of the possibility, frequency, and importance of such infections, as awareness and skill are required in detecting them.

Case-finding

Death and notification rates in the U.S.A. indicate that the control of tuberculosis has by no means been accomplished even in the economically highly developed areas. The high yield of cases from routine chest radiography of patients admitted to general hospitals was emphasised. But schemes of this nature must be accompanied by an efficient machinery for dealing with the cases of tuberculosis so discovered and tracing the contacts. The dangers of radiation from chest X-rays appeared to have been over-emphasised, particularly in the U.S.A. and Great Britain. The possible dangers called for regular, efficient monitoring of X-ray techniques rather than reduction in the use of radiography as a case-finding method. Miniature photo-fluorography can probably be made as safe as the taking of large films. Mass radiography should in general be used in high-prevalence populations rather than in attempts at total-community or repeated surveys of known low-prevalence groups.

Tuberculin case-finding programmes were considered. It was re-emphasised that the follow-up of those with large reactions might be useful in detecting early clinical and radiographic evidence of disease. Routine testing of infants and children in pædiatric clinics could also be valuable. There was a clear need for more simple tuberculin tests to be developed. The depot tuberculin test, recently investigated in the United Kingdom, was described, and it was suggested that it might eventually be useful as a " marker " for indicating that natural infection had occurred, hence reducing the need for frequently repeated tuberculin tests.

Surgical Treatment

The recently published nation-wide survey in Great Britain in 1953 was described. There was much discussion of the optimal duration of chemotherapy before operation. The well-known fact that morbidity was greater after resection when the sputum was positive than when it was negative was considered; it was agreed that the important factor was the sensitivity of the bacilli—not merely their presence in sputum. The view was put forward that resection could be safely carried out early in treatment, after only a few weeks' chemotherapy, provided that chemotherapy was correctly prescribed and taken. Possibly earlier resection should indeed be more widely carried out in cases where it is possible to decide early that surgery is necessary at all. Certainly individual judgment was better than a rigid policy. There was also difference of opinion about whether thoracoplasty or resection was desirable in those with resistant organisms. Laboratory tests of respiratory efficiency are probably of less help in assessing the safety and disabling effects of operations than is often believed. Clinical and fluorographic assessment usually gives as good an indication as laboratory tests. But in " borderline " cases, valuable information may sometimes be obtained from them. It seemed that not more than 10% of the surgical operations now done were thoracoplasties. Direct comparisons of thoracoplasty with resections are not normally valid, for the types of case selected for the two operations generally differ. Furthermore, the follow-up studies are sometimes meaningless because of the way in which the results are presented. The immediate risks appeared smaller with thoracoplasty. The loss of function after thoracoplasty is probably much influenced by the type of operation; and if an extensive thorough apicolysis is done fewer ribs need be removed, with less loss of function.

Future Problem of Tuberculosis and its Control

The first stage of the eradication of the disease might be described as its elimination as a critical public-health problem; and this might be when no more than 1% at the age of 14 are tuberculin-positive. This stage has been reached in some small areas, but not throughout any one country. Mortality and morbidity statistics are of little value for international comparisons. It was suggested that these can be made only by properly planned and conducted prevalence surveys using tuberculin tests, X rays, and sputum examinations. As prevalence decreases, only tuberculin surveys will become economic. For such surveys a standardised preparation of tuberculin and a uniform method of testing must be used. It seemed desirable to continue collecting data about the reactions to the higher concentrations of tuberculin and to argue about their exact significance later. Tuberculin surveys give an estimate of the chances of becoming infected in a community and hence an indirect estimate of the prevalence of infectious cases. B.C.G. vaccination and tuberculin surveys are not incompatible as control measures as long as mass vaccination is carried out at a fixed age, such as adolescence. It was agreed that B.C.G. vaccination was able to protect a high proportion for many years. Whether it should be used as a mass protective measure must be decided in relation to the known prevalence of the disease. It was stated that in the U.S.A. there was no place for mass vaccination.

An important problem existed at present and would become increasingly difficult to solve: how to arouse and maintain public interest and cooperation in anti-tuberculosis measures with a declining danger from the disease. This deserved much careful study in all countries. So did the important question of how to help people maintain regular self-medication of the anti-tuberculosis drugs, in order to secure their maximum effect in reducing infection within the community.

ORTHOPÆDICS

A POSTGRADUATE conference on orthopædics was held by the Royal Faculty of Physicians and Surgeons of Glasgow on Nov. 17–21. The subjects included rarefying disease of bone, vascular lesions, and the crushed chest.

Rarefying Disease of Bone

Dr. B. E. C. NORDIN defined osteoporosis as a loss of bone mass, where the relative proportions of mineral and organic material were preserved. In osteomalacia the mineral content was reduced in relation to the organic component, but these two diseases—osteoporosis and osteomalacia—might occur together. Osteoporosis would not show radiologically until 50% of the bone mass was lost; and histologically detection was

very difficult. About 10% of all patients who died in hospital had some degree of osteoporosis.

Dr. Nordin classified osteoporosis into: (1) generalised primary osteoporosis, including idiopathic, postmenopausal, and senile types; and (2) generalised secondary osteoporosis, including hyperparathyroidism, Cushing's syndrome, thyrotoxicosis, and possibly acromegaly, scurvy, diabetes, liver disease, Turner's syndrome, and eunuchoidism. There was also a localised form, including immobilisation, rheumatoid disease, and Sudeck's atrophy.

He described 92 cases which he had studied—32 central, 30 peripheral, and 30 of mixed type. The patients' age averaged over 50 years; there were 77 females and 15 males. Clinically the main complaint was low back pain, and bilateral ache in the thighs. Kyphosis and loss of height might be present, and the thorax tended to descend on to the pelvis so that pain was felt when the ribs impinged on the iliac crests.

Osteoporosis might be due either to diminished bone formation or to increased bone destruction. It was the modern idea that nitrogen metabolism, as well as calcium metabolism, was affected—the matrix hypothesis. Sometimes lesions of the endocrine systems were inculpated, as well as pure calcium defects. Dr. Nordin thought that the lesions of osteoporosis could be explained purely on calcium metabolism, citing studies with ^{47}Ca, and the fact that fractures in osteoporosis healed normally. The alkaline phosphatase of these patients was also normal. If the lesion of the bone was destructive, then the fault might be in calcium intake, calcium absorption, or calcium output. In his series all three lesions had shown in some cases. Calcium-balance studies showed that many cases could be put into positive calcium balance by increasing calcium in the diet. Clinically, 79% were improved by calcium, while 6% were improved by calcium with vitamin D, and only 15% were not affected. He suggested that, until modern studies were complete, it was necessary to maintain an open mind on the pathogenesis of osteoporosis.

Dr. IAN ANDERSON thought that there was a metabolic type of osteomalacia, which was rare, and he pointed out that in his hospital vitamin-D deficiency had become exceedingly rare. X rays might show nothing, or rarefaction of bone; but he agreed with Dr. Nordin that 50% of destruction was required before radiological signs became evident, though there might be thickening of the epiphyseal line or pseudo-fractures. There was a high alkaline phosphatase level.

Dr. J. C. EATON pointed out that vitamin deficiency might be due to therapeutic dietary deficiency—e.g., a patient of his who had been on a fat-free diet for years. The distinction between osteoporosis and hyperparathyroidism was difficult, and must await the estimation of parathyroid hormones in blood or urine.

Vascular Lesions in Orthopædics

Mr. D. LL. GRIFFITHS (Manchester) confined his remarks to Volkmann's ischæmic contracture. This was not the ideal name, as ischæmia sometimes involved many tissues beside muscle. He reviewed 55 cases, 44 of which were due to closed injuries and 11 to open wounds. Of the closed injuries, 41 were in the upper limb. He believed that the main causal factor was mechanical stretching of the artery, either at the time of the injury or at the hands of the surgeon; and the diminished incidence of this condition in the upper limb was due to improved methods of reducing fractures—in particular cessation of the practice of traction of the elbow in extension and completing the greenstick fracture of both bones of the forearm.

He discussed the management of cases encountered possibly seven, eight, or nine hours after the onset. Systematic blood-pressure should be restored and the blocked artery explored—and this (contrary to an opinion previously expressed) before a deliberate attempt at closed manipulation of the fracture. The artery should not be explored until arteriography had been done to show the extent of the block. On exploration any obstruction to the vessel should be removed, and only if the damage to the vessel was obvious and severe should the damaged portion be resected. This would be done not with the intention of relieving spasm, but in order to avoid consecutive thrombosis. An artery showing only spasm should not be resected; 2·5% papaverine solution should be applied locally. Sympathectomy would not prevent Volkmann's contracture, but it should be done for the sake of the skin.

Dr. R. L. RICHARDS discussed the medical aspects of vascular lesions as they might present to the orthopædic surgeon. He had found in a review of cases attending his vascular clinic 24 who also attended the orthopædic clinic with the same complaint. Of 8 presenting with proximal lower-limb pain, 5 appeared to be orthopædic in origin and 3 vascular in origin.

Mr. R. B. WRIGHT said that there were three types of venous thrombosis in the lower limb. The first was spontaneous thrombosis in varicose veins. The second was superficial thrombophlebitis. The treatment was not to put the patient to rest; instead the area involved should be supported with a local pad and strapping, and the patient should be kept ambulant. As regards deep vein thrombosis, he enumerated as causes intimal damage, stasis, and increased clotting tendency, all of which contributed to deep vein thrombosis complicating orthopædic procedures or fractures.

Mr. A. R. PARKES agreed that most cases of Volkmann's contracture were due to arterial damage. He believed, however, that in some cases ischæmic changes in muscle and nerve after injury arose from the tension in the deep fascial compartment of the limb. He suggested that it was rational to attempt treatment initially by application of a sphygmomanometer cuff over the limb, at a pressure of 70 mm. Hg. Venous blood barred from the easy superficial route might then pass through the deep compartment at slightly higher pressure. He described a case in which by so doing he had produced almost immediate improvement of the nerve lesion, the manifestations returning with the cuff's removal and passing off again with the cuff reinflated to 70 mm. Hg. He believed that by proceeding with this he had avoided the necessity of opening up the deep fascia and producing a bulging wound in the forearm with all its difficult features.

In further discussion, there was general agreement that heparin was to be preferred to any oral anticoagulant in the initial treatment of phlebothrombosis.

The Crushed Chest

Mr. W. SILLAR said that in a personal study of the records of 503 cases of chest and rib injury over four years he had found 27 with a flail segment resulting in paradoxical movement. Severely crushed chest arose most often in works accidents, mining accidents, and road accidents. One survey in Indiana showed that 25% of traffic-accident deaths were due to crush injuries of the chest. A survey in the Radcliffe Infirmary, Oxford, indicated an absolute as well as a relative increase in the incidence of all chest injuries.

Emergency management on admission included provision of an adequate airway, treatment for shock, aspiration of the bronchial secretions and saliva from the air-passages, tracheostomy, relief of tension of the pneumothorax, and the closure of sucking wounds if present. Aspiration of a hæmothorax might be required but was not so urgent. The main problem thereafter was the management of the flail segment of the thorax. Occasionally pad and strapping had some beneficial effect in increasing tidal volume, but this should not be relied on.

Complications of the injuries included surgical emphysema and traumatic asphyxia, neither of which seemed to have serious consequences; pneumothorax; and cardiac embarrassment by impaired venous return.

The flail sternal segment was more serious and more difficult to control than a lateral segment of the thoracic cage. Direct traction by slings round the ribs could conveniently be

employed, using the bedframe developed at the Birmingham Accident Centre, but it had the disadvantage that the patient could not sit up. A method advocated by Adams of Chicago might be more applicable in these cases: a hoop was fixed to a back brace, held in position by axillary and groin straps. If the rib traction was excessive, the patient was unable to breathe out. Mr. Sillar did not find internal fixation helpful. He had seen one case where the fractured sternum was stabilised by a vertical plate. He had made experiments with the application of an insulated acrylic patch bonded directly to the skin with gum mastic, but had not used the method in practice.

The need for tracheostomy was apparent in many of these cases, where there was failure to reach satisfactory tidal-air requirements by other means; tracheostomy permitted adequate bronchial toilet and aspiration of secretions.

Dr. H. H. PINKERTON, dealing with the problem from an anæsthetist's point of view, suggested that adequate relief of pain in the early stages was achieved by repeated doses of pethidine, by intravenous procaine, or by chlorpromazine. Lack of adequate filling pressure impaired the cardiac venous return. These patients were unable to cough, and air was shunted internally from lung to lung. The immediate emergency was met by intubation of the anæsthetised patient, and this was followed by attempts to stabilise the mobile thoracic cage. Curarisation might be required in a conscious patient to abolish respiratory struggle against a respirator; but this was most unpleasant for the patient, and required heavy sedation.

Mr. KENNETH FRASER recommended direct admission of these cases to an anæsthetic or resuscitation room where anæsthesia and intubation could be carried out as a first-aid measure. The hypercapnia consequent on the injury was often underestimated and produced cerebral congestion with excitability and non-cooperation. He doubted the value of strapping except as an emergency first-aid measure. In some cases, where full facilities were not available, the transfixion of the overlying soft tissues by multiple pins and weight and pulley traction might be adequate.

Mr. P. S. LONDON (Birmingham) said that relief of pain alone by suitable intravenous injection might bring about much improvement in the condition of a patient with moderate paradoxical respiration, particularly where the rib fractures were posterior. The amount of weight traction required was usually 1–2 lb., and this might have to be maintained for from ten to fourteen days. Traction by towel clips on the ribs was often easier than by encircling wires. The cardiac damage at the time of injury might be severe enough to cause subsequent death.

Occasional Survey

THE BACKBONE OF THE ANTIBODY

N. R. LING
B.A. Cantab.
SENIOR BIOCHEMIST, AREA CENTRAL LABORATORY, BATH

THE astonishing specificity of antibodies and their ability to distinguish minute differences in chemical or spatial configuration of the antigen has been thoroughly investigated by Landsteiner and others by modifying or introducing groups (haptens) on the antigenic surface. The portion of the antibody not directly involved in attachment to the antigen—the backbone—has received far less attention.

Comparison of the various procedures for producing antiglobulin sera has not suggested any differences of backbone structure of antibodies of a given species. Injection of an animal with immune globulin from a foreign species has produced only antibodies directed against the globulins as such, no matter whether the globulin was in its native form, alum precipitated, or in the form of an immune antibody precipitate with an antigen (Treffers and Heidelberger 1941), of natural antibody attached to the host's cells (Milgrom et al. 1956b), or of autoantibody eluted from the donor's cells. The use of a foreign globulin denatured thermally or by attachment to its antigen for the immunisation process appears to yield a more potent antiglobulin serum which reacts with the denatured globulins of other species as well as with the native globulins of the species used for the immunisation (see, for example, Furth 1925, Adler 1956, Glynn et al. 1957).

Evidence has been collecting, however, that, in a given species, and even in a given animal, differentiation is made between native and denatured antibody, the latter evoking an immune reaction apparently in much the same way as complement fixed in vivo evokes the production of an antibody, immunoconglutinin (Marks and Coombs 1957). Uwazumi (1934), for instance, was able to produce precipitins in rabbits by injecting them with heat-denatured rabbit serum. Milgrom et al. (1956a) found in 0·5% of human sera an antibody which reacted with incomplete anti-D attached to group-O Rh-positive cells but not with native anti-D or any other serum-globulin. These workers then proceeded (Milgrom and Dubiski 1957) to immunise rabbits with escherichia and proteus agglutinated by a corresponding rabbit immune serum, and produced antiantibodies against the corresponding fixed antibody. Both antiantibody preparations reacted with sheep cells sensitised with rabbit immune antibody. Immunisation of a rabbit with an antigen (guineapig leucocytes) produced first (leucocyte) antibody and later antiantibody in addition.

This result accords with the hypothesis of Najjar and Fisher (1955, 1956) that antisera contain antibodies which react with antigen and others which react with the antigen-antibody complexes. These workers showed that, when an enzyme-antigen (yeast alcohol dehydrogenase) was neutralised with a rabbit antiserum, a small but readily detectable enzymic activity remained in the precipitate. Immunisation of another rabbit with the enzyme-antibody complex yielded an antiserum which had little effect on the activity of the original enzyme but greatly inhibited the residual activity of the enzyme-antibody complex. An antiserum containing both types of antibody was obtained by long-continued immunisation of the rabbit with the original antigen.

If shown to be of general validity this phenomenon may throw light on the numerous attempts to produce autoantibodies by immunisation of animals with tissue or modified tissue antigens in that if, as is conceivable, the first-stage antibody is fixed in the tissues the circulating antibody present at the end of the experiment may be directed against denatured antibody or an antigen-antibody complex. Antiantibody might also be expected in sera of patients with chronic infections. Using a tuberculin hæmagglutination test, however, we have not been able to demonstrate specific antiantibody in the sera of chronic tuberculous patients showing a high titre in the tuberculin hæmagglutination test.

Much other relevant information has come from the intensive study, during the past few years, of the Rose-Waaler factor. This globulin, present in the serum of rheumatoid arthritics, reacts with rabbit antisheep hæmo-

lysin attached to its antigen but not with the native hæmolysin (Jochem et al. 1955). It reacts in a similar way with several antigen-fixed antibodies, including some in human sera and with thermally denatured human γ-globulin (Edelman et al. 1958) but not with native antibody. Glynn et al. (1957), after a study of most of the systems which have been employed, concluded that the Rose-Waaler factor should be regarded " as a form of auto-antibody; not to a normal body constituent but to one already modified by a form of denaturation."

One antibody in human serum which is highly active in a Rose-Waaler type test is directed against an erythrocyte-coating substance produced by gram-positive organisms. It is present at varying levels in most human sera, including Rose-Waaler positive sera. The antibody and Rose-Waaler factor coexist and do not interact until the configuration of the antibody is altered by attachment to its antigen (Ling and Gibson 1957). Another antibody is frequently present which, although directed against the same antigen, does not form a target substance for the Rose-Waaler factor even when attached to its antigen. Certain anti-D sera when attached to D-positive cells provide an active substrate for sera containing the Rose-Waaler factor, while others do not (Grubb 1956, Waller and Vaughan 1956). The sensitising quality of an antibody for the demonstration of the Rose-Waaler phenomenon cannot be predicted from its species, its antigen, its hæmolytic efficiency, its agglutinating capacity, or even with certainty from whether it is of " immune " or " natural " type. A common factor in the form of an aminoacid sequence or set of groupings along the backbone of the antibody molecule, the presence or absence of which bears no relation to the classical divisions of immunology, determines the substrate suitability of an antibody for the Rose-Waaler factor.

It may become possible to divide antibodies into groups, not according to their adaptation towards a particular physicochemical surface, but, in a realm of lower specificity, by their backbone structure. This alternative classification, though of limited interest in diagnostic laboratories, is likely to be of the greatest significance in the study of γ-globulin metabolism.

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Medicine and the Law

Army Medical Reports

THE use of Army medical reports in court proceedings arose in a recent murder trial.[1]

Leslie Gordon Colville was charged with the murder of a woman. Counsel said that the defence would be diminished responsibility; two doctors would say that there was hereditary insanity, that Colville's father had committed suicide, and that at the time of the alleged murder Colville was suffering from a disease of the mind which the doctors would call depression.

Dr. Leslie Ford, medical superintendent of Three Counties Hospital, said in evidence that he had arrived at his opinion after a conversation with a Lincoln prison doctor and after seeing a copy of documents made available by the Army Council with regard to medical treatment given to Colville in 1944.

On the judge asking for the documents, counsel said that the copies had been supplied on condition that they were not read in court. The judge commented: " This is absolute nonsense. The jury are bound to be shown the data on which the opinion is based. The Army Council cannot say ' You cannot produce documents ' in a murder case." The judge then said that he would adjourn the trial and that a subpœna would be issued addressed to the Under-Secretary of State.

When the trial was resumed, defence counsel said that he had now got permission to use the documents.

The jury found that Colville was suffering from diminished responsibility; he was accordingly found not guilty of murder but guilty of manslaughter under section 2 of the Homicide Act, 1957.

At the end of the trial an explanation was offered on behalf of the War Office. They had made it clear, it was said, that no privilege was claimed for the original records and, if required, they would be produced on subpœna. The stipulation about production of the copies was inserted because the originals were available for the inspection of the court.

1. *Times*, Nov. 18, 19, 20, 1958.

It is satisfactory to find that the War Office were not claiming privilege for these documents, and it is to be hoped that this will be standard practice. But it remains the law that Crown privilege could have been claimed, in which case it would seem that the judge could not have compelled their production. It is obvious that there must be some privilege for State documents, but it is unsatisfactory that Crown privilege can be claimed without the courts being able to see whether there is any good reason (such as national security) for so doing. There have been cases in which Government departments have claimed privilege apparently in order to defeat the ends of justice. There ought to be some system by which the courts can ascertain whether claims for Crown privilege are really justified.

Fit to Plead

Sent to Broadmoor as unfit to plead to a murder charge in June, a 27-year-old labourer made such progress at the institution that he has since been certified sane and has stood trial.[2]

The man, Clive Pickering, was charged with murdering one Boucher by pushing him into a river on March 30. At the coroner's inquest a verdict of accidental death was returned, but Pickering subsequently made a number of statements saying that he had pushed Boucher into the river.

At his trial last month, Pickering said that he had nothing to do with the death. He did not remember the statements or being at the Assizes in June. He did remember being at Broadmoor and firmly believed now that he was as sensible as anyone.

Dr. J. L. Walker, senior medical officer at Armley Prison, said that Pickering was an entirely different person when he came back from Broadmoor. He now realised how mentally ill he had been and had lost his delusions and hallucinations. He could not be said now to be other than sane.

Pickering was found not guilty of the charge of murder and was discharged.

2. *ibid.* Nov. 11, 1958. *Scotsman*, Nov. 11, 1958.

In England Now

A Running Commentary by Peripatetic Correspondents

LEARNED societies which meet in one laboratory after another rarely seem to have any difficulty in finding meeting places, and they even get invited to the same department many times. This may be all right for large departments with plenty of secretaries and an expendable lecturer or two, but small departments should beware. Now that we have entertained the Agnoiological we know. It all started by the boss drinking too much *Pouilly Fuissé* at the meeting of St. Unjust's and expansively inviting the society to come to our place next time. They accepted with alacrity, and he survived to regret.

He spent many a sleepless night foreseeing himself paralysed in the chair while Professor Graceless, considerably his senior, spoke on negative results for 35 minutes (allowance 10 and 5 for discussion) and the audience one by one rose, booed the chair, and departed. Later we learnt that he had other fears, like stopping too late for a drink before lunch or too early for anything before tea, and once he asked timidly, " How do I know when a discussion is interesting ?" The rest of us gave him a kitchen-timer with a loud ping, which consoled him slightly, and worked out little matters like finding food for 100 and accommodation for 60 bodies, which we decided after much correspondence with the secretary of the Agnoi's was the best estimate we could make of the likely comers. On the closing date for applications we had received forms from 11 members, covering themselves and 4 guests. It looked just worth not scrapping the meeting, and we retrenched frantically, apologising to the catering powers-that-be and going on bended knees to the hostel warden.

When we had made our peace, the applications began to roll in seriously. We drew lots who should go to the administrator to say, " About that 100 lunches we cut to 40—can you do 200 ? " The envoy returned alive but shaken, with a promise of 110 lunches, so we had to tackle the question of priorities in earnest. The senior lecturer, an upright man, said, " Order of application, of course ", whereupon our technician drew a line below the 110th name on the list and looked at us with wide innocent eyes. Above the line there were perhaps a dozen names we knew, including one professor: below, 14 professors, 18 other notables, most of our best professional friends, and about 5 nonentities. The S.L. looked very sad and we sent him away to plan signposting of the building. Someone said, " Let's reserve 10 places for distinguished visitors ", and this was carried unanimously, but it didn't help much. The number was raised to 12, and then 15, and then someone said very quietly, " I'd rather end up as a professor than a senior lecturer. Let's reserve 10 places for early applicants and allot the rest to distinguished visitors. It's really fairer that way." It was so fair and simple that we wondered why we hadn't thought of it sooner, and we dispatched meal tickets with light hearts.

Even so, some very late comers had to be put off, and it then appeared that they could, after all, deal with matters by return of post. " . . . a pity it was not realised that members would like to get together over meals ", " have always applied late and never before . . . ", " . . . have already invited my 9 guests so it is not possible for me to put any of them off now. I am very surprised that you have not made adequate provision sooner." Most of these letters arrived the day before the meeting, when the whole department knew more than it ever dreamt of about its capacity for psychosomatic disorders. Ergotamine, belladonna, and phenobarbitone appeared in the order book marked urgent, together with an ominous item " strychnine, two ounces ", and there was reputed to be a black market in throat swabs guaranteed to grow beta hæmolytic streptococci. Of the meeting, the less said the better. The only funny thing about it was that so many members said at the end how much they'd enjoyed it. They were mainly the ones who'd booked early, sent the right money, and withdrawn requests for some meals because they'd heard the demand was excessive.

We haven't sorted the accounts yet, but we think the only way of breaking even will be to sell the inside story to a sympathetic editor.

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To the newcomer, Chinese hospitality is an experience. At my first dinner there were about 25 tables and 150 guests. Among the 20-or-so courses served, sucking pig stood out, and, of course, the last dish—fried rice—which nobody who has any manners would touch. (It would suggest to the Chinese host that the meal had not been satisfying.)

Then there was that delightful custom—the guest of honour. He and his host went from table to table drinking a toast at each. We were one of the last tables to be visited. The guest was staggering along in a semi-supported state; his host cool as a cucumber. We suspected his glass was filled with tea. The guest's glassy eyes were riveted on the ceiling, his gestures automatic as he downed one more brandy, and he never reached the next. This distinction luckily passed us by. We welcomed the custom of immediate departure when the meal was finished. Conversation after 20 Chinese dishes would have been impossible anyway.

My most outstanding dinner, however, was one given by Chua in honour of the arrival of his first grandson. Just as we were preparing to leave, after a meal that had been even more satisfying, elaborate, and extensive than any other, he asked us all to sit down again.

There was a final treat . . . expectant faces turned to our host, who pointed to a screen. Behind this screen, he said, he had his family doctor, who would give a penicillin injection to any of the guests who so desired. In the ensuing tumult and applause we left quietly, once more marvelling at the Chinese appreciation of Western medicine.

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Extreme shortness of breath had caused the patient to seek medical aid one night. His own doctor was away and the deputy prescribed a much-advertised proprietary mixture of antibiotics. The proper doctor, next morning, knowing that the patient had been hypertensive for years, made the correct diagnosis and prescribed an equally well-advertised hypotensive agent, but one which unfortunately takes some weeks to become effective. Other drugs with capital initial letters were tried, but without success, and the patient had to be admitted to hospital. My house-physician, fresh from one of our leading medical schools, was puzzled by this therapeutic saga, fully set out in an excellent letter. " Why didn't they give morphia ?" he said. My registrar supplied the answer, " Morphia isn't advertised."

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UROSCOPY—a new diagnostic tool: or, Lines written on a Pathologist's complaint that housemen sent him urine specimens which they had not Inspected.

The Physician, in addition
To his diagnostic tricks,
Should cultivate Uroscopy if he is in a fix;
For inspection
Brings detection
Of the earliest infection,
And pathologists the new invention bless.

The Surgeon needs no urging
To employ this useful art.
Cystoscopy and I.V.P.
Now play a minor part
In detection
Of infection
Since we do it by inspection,
And the microscope is needed less and less.

Clinician and Technician
Now join in songs of praise.
Contemplative Uroscopy shall occupy their days
Now infection
By inspection
Cannot escape detection;
And we'll use our agar plates for growing cress.

Letters to the Editor

MEDICAL EMIGRATION

SIR,—Your leading article of Nov. 29 is timely. It has been clear for some time that, despite the security offered by a post in the National Health Service, doctors are leaving this country in significant and perhaps unprecedented numbers, and those who are in touch with the situation are aware that there are in addition others who would like to go but are prevented from so doing by domestic ties and other circumstances.

Why this exodus? The reason is obvious in the case of registrars and would-be family doctors who cannot find employment in this country, but the causes of emigration amongst established research-workers, family doctors, and consultants are more complex. Financial considerations undoubtedly play a part but it would be naïve to assume that this is always the sole explanation. It is a matter of observation the world over that men and women will accept comparatively modest rewards provided they are doing work they want to do in the way they want to do it. I have no doubt, from personal knowledge, that some medical emigrants are doctors whose sense of craftsmanship is outraged by present conditions. Can a practitioner burdened by crowded surgeries and often denied direct access to laboratories be expected to retain his early enthusiasm or keep up to date? Can we expect research-workers to put up indefinitely with overcrowded laboratories, antiquated equipment, and, in many cases, personal hardship? The loss to the country of a comparatively small number of rebels may not be important. What is important, however, is that perpetuation of the situation responsible for the migration must inevitably lead to the gradual extinction of zest and drive in those who remain.

The National Health Service has brought great benefits to the people, to hospitals, and to doctors, but in all social experiments adjustments become necessary from time to time in the light of experience, and medical migration is one of several signs that the moment has come to define and evaluate the causes of discontent among doctors and to press with vigour for such reforms as are needed to retrieve the situation.

London. F. A. ELLIOTT.

SIR,—In your leader of Nov. 29 you ask whether we are attracting to this country undergraduates and postgraduates on the same scale as formerly. The answer is that in fact more and more students and particularly postgraduates are attracted to this country, but alas fewer can come because accommodation in medical schools, universities, and postgraduate institutions is restricted by the special system of medical education in this country, based on personal attention and supervision.

We cannot compare postgraduate education in this country with that on the Continent, which allows for more postgraduates and undergraduates, but, in general, not for personal attention and supervision. Continental universities advertise widely their facilities for medical education and the medical papers have a list of new arrivals of postgraduates every week—and it is an impressive list. The postgraduate, in particular, is not subjected to any formality but arrives unheralded in the university town, chooses any of the postgraduate courses, and walks the hospitals without any special permission, except for the presenting of his visiting card.

I do think that, without changing the selective system in use in Great Britain, something more should be done for foreign students and postgraduates. Universities and teaching hospitals could reserve a few posts for foreign students; formalities of admission should be curtailed, because they often give the impression that foreign students are not wanted. I suggest particularly a very intimate contact between our medical educational institutions and the offices of the British Council in various countries—not the central office, which cannot help on this point.

Special certificates of attendance and even diplomas restricted to foreign postgraduates would also help. We shall not obtain the great influx of foreign students seen in Continental universities, but we may enlarge the number of our selected foreign undergraduates and postgraduates who will propagate in their own countries the prestige of British medicine.

London, W.1. A. P. CAWADIAS.

SIR,—Your leader on this problem is timely and is couched in terms which express both the anxiety and sense of frustration felt by so many young doctors.

The situation demands urgent action, along lines which are apparent to any keen observer of our service. We are retaining too many superannuable staff within all branches, especially at the centre where advisers too have long ceased active practice.

The status of the Ministry itself has shrunk as the problems calling for solution grow and Cabinet rank is essential if we are to get and retain Ministers of Health and permanent officials worthy of a great productive enterprise which employs over 600,000 people. The mental and physical health of the nation surely warrants a position in the Government at least equal to that of any other major spending department.

In association with loss of Cabinet status, maintenance and capital expenditure on the service has fallen since 1948 when related to the total national product. You rightly state that we are working with outmoded tools; few voices in the profession or in the House of Commons are raised in protest.

There are nearly half a million patients waiting admission to hospital—few know of this fact. In areas where waiting is longest—$6^1/_2$ years in a hospital in the north-west of England—consultant appointments per 1000 beds are the lowest in the country. The Ministry has done little or nothing to encourage equitable consultant distribution, while at regional level medical members of some boards and medical advisory committees have watched regional staffing languish. This is known to have been purposeful in some areas to ensure a continuing flow of patients to the central teaching hospital. While patients wait, hundreds of well-trained senior registrars and others continue to do consultant work for which they are inadequately rewarded. They fear to protest, for promotion is known to be determined in part by docility. Younger consultants do not raise a voice in protest, for merit awards are thought to be determined by an establishment responsible for the present regime. In reply to demands in Parliament the Government sets up a committee, not to ensure urgent action is taken, but to survey leisurely the present staffing structure within hospitals and to make recommendations. Meanwhile the senior registrars are forgotten and yet another committee serves to hide iniquitous injustice to patients and the profession.

The mental-health service has only a skeleton medical staff, while overcrowding in the hospitals makes custodial care almost impossible with meagre nursing personnel.

Mental ill health presents us with our greatest challenge; we are scarcely beginning to meet it, either in our education of students or in our planning to expand psychiatric services.

Although general practitioners are more equitably distributed, many are overworked, too many are too old, and entry to the ranks is too often determined on the "old boy" principle rather than on merit.

Fine young men are qualifying in medicine in Britain today, but their effective deployment throughout the community is blocked by ignorance, inertia, and vested interests. You are attempting to remove these—I trust that the Government, the profession, and all administrative bodies will ensure the success of your efforts.

Central Middlesex Hospital,
London, N.W.10. HORACE JOULES.

IN THE DOLDRUMS

SIR,—It was with great interest that I read the letter in the Widdicombe File of Nov. 29. If the primary F.R.C.S. is an anachronism for general surgeons, what can it be for ophthalmologists? Yet we are being pushed more and more into taking this examination by the Faculty.

The primary F.R.C.S. seems to be designed more to examine the memory of an obsessional neurotic with a penchant for anatomy than that of a normal person who wishes to learn some of the methods and results of the basic medical sciences with a view to applying them to his own subject.

On the fellowship course I have been advised to remember certain facts, even though the lecturer thought them unimportant and probably untrue, because one of the examiners might be hurt if told the truth and would take appropriate action. It is still necessary to know all sixteen ossification centres for the sphenoid because one of the surgeons not uncommonly asks this question. Many of the questions asked in the viva are on the intellectual level of a television quiz programme.

I have heard it said that it is for prestige reasons that ophthalmologists have to take the primary F.R.C.S.: to show that we are as clever as any surgeon! If this is so then we have truly plumbed the depths in medical education. Instead of the primary I suggest we be made to learn some of Shakespeare's plays by heart; both patients and colleagues would soon be impressed by our learning and the general educational value of this feat would be considerable. It would be better if the Faculty concentrated on training people to be good ophthalmologists and left our prestige, for what it is worth, to look after itself.

In addition, encouragement to do research, especially in the provinces, is minimal; so it is not surprising that there is an extreme dearth of good papers produced by clinical ophthalmologists.

Owing to the autocratic structure of our profession, this state will continue until there is a change of heart among its senior members.

JUNIOR OPHTHALMOLOGIST.

SKIN ANTISEPTICS

SIR,—In your very interesting annotation of Nov. 29 I was surprised to find that no mention was made of 'Penotrane', or indeed of any other organic mercurial.

Penotrane has now been used for a considerable time in a number of hospitals: its efficacy has been carefully assessed both clinically and experimentally [1] and a number of papers have been published. My colleagues and I at the Royal Infirmary, Liverpool, carried out experiments [2] on patients from the surgical wards with the object of demonstrating the penetration of this antiseptic into the depth of follicles and sweat glands, and its sterilising effect on the skin.

The results were compared with tincture of iodine used in a similar way and it was found that penotrane had a bactericidal action comparable with that of iodine but had none of the well-known disadvantages of iodine.

Another very important factor, not mentioned in your annotation, is the retardation of activity of antiseptics in the presence of serum.

Liverpool. HUGH REID.

1. Goldberg, A. A., Shapero, M., Wilder, E. *J. Pharm. Lond.* 1950, **2**, 20, 89.
2. Reid, H. Black, T., Dean, D. *Practitioner*, 1958, **180**, 707.

THE HOMELESS AND THE COMPANIONLESS

SIR,—Two important groups of elderly people are those who live alone and need a companion for their physical often as well as their mental wellbeing, and those who are physically in many cases fairly fit but, being homeless, are very lonely. In a geriatric hospital problems concerning these groups are apt to arise, and recently I have found it possible to place patients of these two types together when they are discharged.

I am, of course, limited to the hospital patients who have been rehabilitated, but I feel there is still much work to be done in helping such people to get in touch with each other. By creating such opportunities a practical step could be made to reduce the long waiting-lists which many local authorities have for their old people's homes.

There are often difficulties to be overcome, such as the elderly's reluctance to get to know new people sufficiently well to be prepared to consider living with them. Probably local-authority medical and welfare officers are in a better position to bring together old people with these problems than those of us working in geriatrics, who still spend a large part of our time in hospitals.

I do not know to how great an extent arrangements such as these formally exist either in this country or abroad, but comments from your readers on this problem would be interesting.

High View Hospital,
Exhall, near Coventry. JAMES ANDREWS.

SENSITIVITY TO SUXAMETHONIUM

SIR,—The report by Dr. Lehmann and Dr. Simmons (Nov. 8) emphasises the importance of clinical notation of sensitivity to suxamethonium, and of informing the patient or relatives of this sensitivity. I have anæsthetised two sisters with such sensitivity, but I was forewarned by the mother's story that a cousin of the children had died the previous year for some unknown reason following tonsillectomy.

The sisters were admitted to hospital for tonsillectomy. The first, 9 years old, weighed 65 lb. She had had infectious hepatitis twelve months previously, and had recovered uneventfully. Induction was with thiopentone (150 mg.) and suxamethonium (20 mg.), followed by oral intubation and maintenance with 70% nitrous oxide with oxygen via a non-return system. A minimal amount of ether was added. Twenty minutes after induction the ether was turned off, but adequate respirations did not return for another forty-five minutes.

The hepatitis was considered a possible cause of the sustained effect of the relaxant; but great care was taken with the second child, who was 7 years old and also 65 lb., and who had had no previous illness. Induction was with nitrous oxide, oxygen, and ether. At stage 3, plane 1, 1 mg. of suxamethonium depressed the respirations for two minutes. A second dose of 1 mg. had a similar effect for two minutes. Five minutes later 2 mg. resulted in apnœa that lasted three minutes.

An unrelated girl, aged 7 years, weighing 52 lb., who had received the same premedication as the second sister, was studied for comparison. Induction was with nitrous oxide, oxygen, and ether. 1 mg. of suxamethonium produced no

effect. A further 1 mg. produced no effect. After five minutes 2 mg. resulted in slight depression of respirations. Five minutes later 4 mg. produced some respiratory depression, but relaxation was not enough to allow intubation. A further 10 mg. produced full relaxation with apnœa lasting two minutes.

Pseudocholinesterase determinations were not possible at the time, but the mother of the sisters was told of the probable condition and given a note describing the response of her two children to the drug.

St. Mary's Hospital, Montreal. DAVID J. POWER.

HOW MANY OF US SHOULD THERE BE?

SIR,—Lord Taylor is reported in your issue of Nov. 29 (p. 1182) as saying in the House of Lords that the birth-rate in Harlow New Town is 32 per 1000 of the population compared with the national rate of 16. Though he admits (according to *The Times* of Nov. 21) that the difference is partly due to the youthfulness of Harlow's population, the impression gained from his words is that procreation is proceeding twice as fast in Harlow as in the country as a whole.

Harlow's abnormally youthful population, however, makes a great deal of difference. Children under school-age form 20% of the community (hence the soubriquet, Pram Town) compared with the national figure of 7%. The average age of the adult population in Harlow is 34,[1] the national average being 47. The average age of the whole community in Harlow seems to be about 27, compared with the national average of 39. Corrected for national age-structure, the Harlow birth-rate therefore seems to be not 32 per 1000 but roughly 23.

What matters, however, is not birth-rate itself but natural increase—the excess of births over deaths. Natural increase in Harlow is now masked by large-scale immigration, and death-rate is abnormally low owing partly to the youthfulness of the community and partly, no doubt, to the exceptional measures being taken to preserve life. Judging from the impressive accounts of these measures which have appeared in *The Lancet* it would indeed seem that only those Harlowians who possess unusual obstinacy and determination can defy their doctors and die. Advancing years will, however, make their task easier. In due course the death-rate will rise to the national figure of 11. This, with a birth-rate of 23, will give an annual natural increase of 12, compared with the national figure of 5.

Lord Taylor thinks that Harlow's high birth-rate is a matter for rejoicing. But what about the future? In all the new towns population is subject to an ultimate maximum which, for Harlow, is 80,000. Surprised at the rate of procreation and anxious that a reasonable proportion of the rising generation shall be retained, the Development Corporation of Harlow have decided to stop house construction at 18,000–19,000 houses instead of at 23,000 as originally intended, leaving the remaining 4000–5000 to be filled by natural increase. Otherwise "either the 80,000 figure could be maintained only by *sending away* [my italics] the younger generation; or the 80,000 figure would be exceeded and the whole conception of the town and the close integration of housing with the service of shops, open spaces and playing fields would be jeopardized."[1]

This device, however, only puts off the evil day, for when the full number of houses are built (they will be needed in twenty years) procreation will obviously continue at an undiminished rate. The words "sending away" have an ominous ring. They suggest that individuals are to be sacrificed to the maintenance in perpetuity of the planners' conception of the ideal town. From Harlow about 1000 will have to be evicted annually and a similar number from each of the other new towns, making altogether a very large number. Where are they to go? Older towns may not want them. Are they to undergo compulsory emigration to countries overseas? Will these countries be able to accommodate them on such a huge scale? Voluntary departure is one thing; eviction is quite another. Harlow seems to be intended to serve in part merely as a breeding-ground.

But will mass eviction be enforceable? Let the corporations just try and see what happens to them. Let them take warning from the resistance recently shown by the Surrey caravanners. We may imagine Lord Taylor's successors visiting a house twenty years hence and saying: "This house was only meant for 5. There are 7 of you. 2 of you must leave the town." To which the retort may well be: "You provided ideal conditions for our conception and took exceptional measures to preserve our lives. You rejoiced at our birth and our numbers were your proud boast. But now that we are grown up you think you can drive us out. You can go to Hell. We are staying here." And stay they will, despite bailiffs and policemen, young couples bringing up families under their parents' roofs. There is every likelihood that the Pram Towns of today will be the Slum Towns of tomorrow. Admirable as are the conditions provided in the new towns in the short run, the long-term result should cause grave misgiving. The combination of encouraged procreation and limitation of community-size must end in disaster.

With the existing birth-rate of 16 the population of England and Wales, now 45 million, is projected to rise to about 50 million by the end of the century. If, however, the conditions enjoyed in the new towns are extended to the whole country so that the national birth-rate rises to the Harlow level of 23 the population by the end of the century will be over 71 million. Comment is needless. For the sake of the prosperity of future generations and the peace of the world, Lord Taylor, instead of rejoicing at increased procreation, should direct his great abilities to the propagation of birth-control.

Chesham, Bucks. FFRANGCON ROBERTS.

1. Reports of the Development Corporations for the period ended 31st March, 1955; pp. 217, 234.

SKIN FRAGMENTS REMOVED BY INJECTION NEEDLES

SIR,—With reference to recent observations on the "coring" of skin with injection needles, have experiments been carried out using triangular shafted and *convexly* sharpened needles? In any case, would not rounding off of the inner cutting edge prevent this occurrence?

Porton Down, Salisbury, Wilts. A. L. LEIGH SILVER.

LATEX FIXATION TEST IN RHEUMATOID ARTHRITIS

SIR,—It is gratifying to note the report by Dr. Burby and Dr. Behr (Nov. 29) of their satisfactory and confirmatory results in England with this test.

The many modifications of these principles have been hitherto largely a monopoly of the American hemisphere, owing to the difficulty in getting the necessary materials in the United Kingdom. This in no way detracts from my own appreciation and gratitude, as well as that of many colleagues, to Dr. Lamont-Havers, of the Arthritis and Rheumatism Foundation of New York, for his generous supplies of the American (Dow) latex particle suspensions. From my own experience in attempting to evaluate a satisfactory test with an available sensitising agent, bovine Cohn fraction II, which is readily available in the British Isles, I have come to a conclusion almost identical to that of Dr. Burby and Dr. Behr.

There is, however, an important addition, which makes the test reagents now wholly available here. I have had equally satisfactory results using the bovine fraction II and a "British"

'Polystyrene' particle suspension kindly supplied by Styrene Products Ltd., an associate of the Shell Chemical Co., Ltd. It is possible, therefore, for all British laboratories to undertake these tests now, without calling on the generosity of American friends.

London, W.1. HARRY COKE.

HYDROCEPHALUS

SIR,—Dr. Laurence has earned our gratitude by his painstaking analysis (Nov. 29) of the records of Mr. McKissock's series of patients suffering from hydrocephalus, collected over twenty years. The figures provide a basis for assessment of the value of treatment in the future. They can be used to sustain with hope the parents of some afflicted children. Also, if it be assumed that there is no way of assessing the separate prognosis in each individual child, they can be used to justify, in the present state of surgical treatment, a strict policy of non-intervention.

To others of us, however, Dr. Laurence's figures, set out in a different form, and supported by a personal knowledge of individual living, and dying, patients, will produce another reaction. The knowledge that in a large group of hydrocephalic children nearly 50% will die after a period of months or years of anxiety and distress to their families, about 30% will survive with decided impairment of mental or physical development, while only about 15% will survive with reasonably good intelligence and with little physical disability, must act as a powerful stimulus to seek to improve treatment rather than to abandon it. The almost unbelievable advances of surgery in the past few years must surely give grounds for hope that some measure of success will crown such efforts.

It is my good fortune to work with neurosurgical colleagues who continue to strive towards success in this difficult and discouraging field, and who, by restricting surgery to those children in whom an unhappy outcome seems inevitable if the disease be untreated, seek at the same time to avoid doing harm to a child in whom there is a reasonable hope of spontaneous recovery. My difficulties are those of trying to assess the prognosis in each individual child, so that I can help my surgical colleagues in deciding when surgery should be attempted and when withheld, and so that we can together tender honest and reasoned advice to the parents.

If Dr. Laurence will in the further analyses he promises show the factors which influence individual prognosis he will greatly increase our indebtedness to him.

Newcastle General Hospital, Newcastle upon Tyne. GEORGE DAVISON.

ASSOCIATION OF FRIENDS OF POLISH PATIENTS

SIR,—Some 1500 Polish patients are undergoing treatment in mental hospitals in England and Wales. Of all the many thousands who suffer in this way none demand our practical sympathy more than these men and women who have in so many cases lost their homes, their families, and their professional status. For four years our Association, thanks to the generosity of readers of the British press, has been enabled at Christmas to send each of these Polish patients a parcel of good things and a greeting in their own language. This year we want not only to do this, but to begin to establish a fund which will enable us to buy and equip a hostel—a "halfway house"—where some cured of the worst of their mental disease can go because they still need the background of a friendly communal life while they are re-establishing themselves in the outside world.

We beg your readers' contributions to these two projects—a Christmas parcel to be sent very shortly to each of these Polish patients, and in due course a temporary home for those who are struggling back into a full and active life.

RICHARD FORT
President.
14, Collingham Gardens, London, S.W.5. A. R. N. ROBERTS
Chairman.

GASTROINTESTINAL HÆMORRHAGE AND SALICYLATES

SIR,—The injection of minute amounts of sodium salicylate into the autonomic plexuses of the abdomen of animals is one of the methods used by J. Reilly to produce the non-specific responses to "stress".[1] These responses are predominantly vasomotor; moreover, gastrointestinal hæmorrhage is a constant finding.

The ingestion of aspirin, a closely related substance, could, in favourable circumstances, induce gastric hæmorrhage in human subjects through a similar mechanism. One would expect the chances to be greater if a pre-existing ulcerated area provided easy access to autonomic nerve-endings and if the subject showed a predisposition to react adversely to stress.

London, S.W.18. D. A. BUXTON HOPKIN.

SIR,—Dr. Alvarez and Dr. Summerskill (Nov. 1) concluded that salicylate consumption "could be incriminated in over 40% of 103 consecutive patients admitted to hospital with hæmatemesis and/or melæna associated with peptic ulcer"; and that severe iron-deficiency anæmia observed in two patients was secondary to occult gastrointestinal bleeding, related to habitual and heavy consumption of salicylate compounds for headaches.

A few years ago, we investigated [2,3] the possible influence of acetylsalicylic acid on hæmostasis. Measures of bleeding-time, capillary resistance, prothrombin activity, and heparin tolerance test were made in 306 patients, before, during, and sometimes after aspirin consumption.

Several groups were distinguished: the first included patients who had no hæmostatic trouble before aspirin consumption; the second included patients who were under anticoagulant therapy with heparin, anti-vitamin-K (phenylindanedione or dicoumarol ethyl ester or both); and the third included patients with hæmorrhagic disease. These groups were compared with controls.

Doses over 30 mg. (gr. $^{3}/_{5}$) per kg. body-weight induced in a few days a prolongation of the bleeding-time, which returned to normal 4 to 8 days after aspirin was discontinued. This effect was observed even in patients with no previous disorder of hæmostasis, but it was much greater when hæmostasis was already impaired by anticoagulant therapy or by hæmorrhagic disease. On the other hand, anticoagulant therapy alone did not generally prolong the bleeding-time to any great extent, even when clotting ability was much reduced.

The effect of aspirin on bleeding-time could not be explained by any fall in capillary resistance or by its known effects on the prothrombin system, which were always very mild, even when prothrombin was already reduced by anticoagulant drugs. We felt that aspirin could reduce "platelet" adhesiveness, but, at present, we believe that its action could also be related to the "intrinsic" activator system of blood-clotting.

Several cases of bleeding related to aspirin consumption were included in this work and it was concluded that aspirin could be a very important bleeding factor,

1. Buxton Hopkin, D. A. *Lancet*, 1955, i, 605.
2. Beaumont, J. L., Willie, A. *Sang*, 1955, **26**, 880.
3. Beaumont, J. L., Caen, J., Bernard, J. *ibid.* 1956, **27**, 243.

especially when hæmostasis was already impaired by disease or treatment. This could throw some light on the cases described by Dr. Alvarez and Dr. Summerskill.

Department of Cardiology,
Hôpital Boucicaut, Paris. J. L. BEAUMONT.

MINAMATA DISEASE

SIR,—With greatest interest I read the fascinating report by Dr. McAlpine and Dr. Araki (Sept. 20) on Minamata disease. They discuss the possible causes for the disease, and they emphasise that thallium or other metal intoxication is the most likely explanation. This metal may have reached the fishing waters in waste products from factories ashore, and humans and animals may contract the disease by eating fish.

It strikes me that the symptomatology is rather similar to that reported in Chastek paralysis of foxes and cats after feeding with certain species of fish. Ender and Helgebostad [1 2] demonstrated that Chastek paralysis can develop in animals on a thiamine-deficient diet; and Green et al.[3] and Ågren [4] have shown that some kinds of fish, in particular carp, contain a thiamine-inactivating substance and that foxes suffering from Chastek paralysis were rapidly cured by large doses of thiamine.

In my report on Haff disease in Sweden,[5] I drew attention to the possibility that thiamine inactivation after ingestion of fish was responsible for the intoxication. The symptomatology of the disturbances in animals observed at the same time as the outbreak of Haff disease in humans was strikingly similar to that described by Dr. MacAlpine and Dr. Araki in Minamata disease.

It will be very interesting to know of any investigations regarding the presence of thiamine-inactivating factors in fish from Minamata Bay, and whether or not human and animal cases in Japan have recovered after being given sufficiently large quantities of vitamin B_1.

Central County Hospital,
Falköping, Sweden. RAGNAR BERLIN.

*** In a letter in our issue of Oct. 4 Dr. Meiklejohn also commented on the possibility that the disease was caused by some natural poison in the fish, and he referred to Dr. Berlin's work on Haff disease.—ED.L.

ORAL PHOSPHORYLATED STILBŒSTROL

SIR,—Successful results have been recorded following the intravenous use of phosphorylated stilbœstrol in the treatment of prostatic carcinoma, and the mode of action of this compound has been discussed in your columns.[6]

For long-term treatment in the home, however, intravenous medication is not practicable. The main advantage of phosphorylated stilbœstrol over other œstrogens is that very large doses can be tolerated without serious side-effects, perhaps because phosphorylated stilbœstrol is relatively inactive, its therapeutic action being due to the liberation of stilbœstrol by dephosphorylation in the body.

High concentrations of acid-phosphatase in the carcinomatous prostate have suggested that dephosphorylation occurs here, liberating active stilbœstrol at the site of the lesion. This hypothesis is supported by the almost invariable perineal burning sensation experienced by patients following intravenous injection of the compound.

The introduction of an oral form of stilbœstrol diphosphate has raised hopes that the same beneficial results may be obtained in long-term therapy. It might be argued, however, that there is at present no proof of the dephosphorylation theory and that the clinical effectiveness of an oral phosphorylated œstrogen might be in doubt.

Recently I was able to demonstrate the œstrogenic potency of oral phosphorylated stilbœstrol.

A lactating mother wished to have her milk suppressed. My usual procedure is to give ethinyl œstradiol (0.1 mg. t.d.s.) for three days and then stop it, to obtain the œstrogen-withdrawal effect. This seldom fails to work. On this occasion, however, there was no effect whatsoever. Accordingly, I gave her oral phosphorylated stilbœstrol ('Stilphostrol') (50 mg. t.d.s.) for three days. This was immediately effective and lactation was completely inhibited. An interesting observation by the patient was that, while taking the drug, she "felt as if she was pregnant". She experienced a distaste for smoking, anorexia, tiredness, and a feeling of oppression in the abdomen. These symptoms she usually associated with pregnancy. They passed off when the drug was omitted.

Although a single experience, the effects in this case were so striking that I, at least, am convinced that oral phosphorylated stilbœstrol has potent œstrogenic activity.

Twickenham. DAVID WHEATLEY.

THE WOLFENDEN REPORT

SIR,—In your summary of the debate in Parliament on the Wolfenden report you omitted, no doubt for reasons of space, any mention of Mrs. Jean Mann's splendid speech, which occupied seven columns of Hansard. I feel many of your readers would have enjoyed it, with its conception of "blackmail in reverse" and other dynamic views, but, of course, they can get the Hansard report of this debate in the Commons on Nov. 26, the best bob's worth of reading I've had for a long time (postage 5*d*.), from H.M. Stationery Office, York House, Kingsway, London, W.C.2.

Beckley, Rye, Sussex. C. G. LEAROYD.

HYPOPHYSECTOMY FOR VASCULAR COMPLICATIONS OF DIABETES

SIR,—In 1954 Luft et al.[1] published a paper on the effect of hypophysectomy on the vascular complications of diabetes mellitus, and hopes were raised that an effective treatment had been found for these disorders. Luft et al.[2] published further papers—the last in May, 1956—and reports also came from Schimek [3] and Kinsell.[4]

The recorded results are hardly impressive. Luft treated 20 diabetics with severe retinopathy in this way. 7 died and, of the remaining 13, 8 had a very moderate improvement in vision, 4 were unchanged, and 1 became worse. Of Schimek's 4 cases only 1 had an appreciable improvement in vision.

It seems likely that this operation has been performed at other centres. A patient under the care of one of us (R. R. B.) was treated in this way at the London Hospital, and we know of 4 cases at another London teaching hospital. Other unpublished cases have been mentioned in American journals.

The effect of hypophysectomy on our patient was disappointing. At the time of operation he could count fingers at 6 feet. Now, one year later, he can perceive light only, and further vitreous and retinal hæmorrhages are occurring. But this patient already had extensive retinitis proliferans, and it can be argued that the operation was performed too late.

1. Ender, F., Helgebostad, A. *Skand. VetTidskr.* 1939, **29**, 1232.
2. Ender, F., Helgebostad, A. *Norsk VetTidskr.* 1941, **53**, 1.
3. Green, R. G., Carlsson, W. E., Evans, C. A. *J. Nutr.* 1942, **23**, 165.
4. Ågren, G. *Svenska Läkartidn.* 1944, **41**, 665.
5. Berlin, R. *Acta med. scand.* 1948, **129**, 560.
6. Brandes, D., Bourne, G. H. *Lancet*, 1955, i, 481.

1. Luft, R., Ikkos, D., Ljunggren, H. *Ciba Found. Coll. Endocrin.* 1954, **8**, 438.
2. Luft, R., Olivecrona, D., Ikkos, D., Kornerup, Y., Ljunggren, H., Nilsson, L. B. *Nord. Med.* 1956, **55**, 715.
3. Schimek, R. A. *Arch. Ophthalmol.* 1956, **56**, 416.
4. Kinsell, L. W. *Bull. N.Y. Acad. Med.* 1957, **33**, 171.

Are we, however, justified in recommending hypophysectomy to patients with retinopathy at an earlier stage? This question must be exercising the minds of many physicians and ophthalmologists. Hypophysectomy is a drastic operation involving some risk to life, and producing irreversible changes in physical state and personality. Our own present view, based on the evidence so far published, is that it is not justifiable to recommend this operation for diabetic retinopathy at any stage. We are sure, however, that everyone concerned with the care of diabetics would welcome further information about Professor Luft's cases; and we would also be interested to hear what experience others have had with this method of treatment.

D. GREENBAUM
The London Hospital, E.1. RICHARD R. BOMFORD.

THE FUTURE OF PSYCHOTHERAPY

SIR,—Prof. Aubrey Lewis, in his learned Bradshaw lectures,[1] has rightly delineated psychotherapy as enveloped in dust and fog.

In psychological medicine and psychotherapy we have I submit, reached the stage which existed in astronomy, physics, and chemistry when many new facts had been discovered which did not fit the basic assumptions of Newton. General mathematical concepts like those of Einstein, Max Planck, and Heisenberg were required to make room for these facts. In psychological medicine F. H. Allport's work on *Theories of Perception*, the event-structure theory, and "kinematics" may prove to be a step in the right direction.

Clearly the social sciences and the biological sciences are equally involved. We lack a basic concept of the potential biological nature of man, the first self-educating animal; and the biological concepts of human perception, speech functions, consciousness, and human dynamisms are still somewhat vague. The situation is made worse when all the facts of the social sciences are prematurely made to fit the not fully verified or limited hypotheses of biology, as is done by the Pavlovian school particularly. As most of the variables of biology and sociology have not yet been defined or evaluated, psychiatry and psychotherapy, wedged between them, must thus find it difficult to reach the level where application of statistics can be relied upon. At present uncontrolled attempts in this direction probably make confusion worse confounded.

A second fact to be faced is that every age has had its own form of psychotherapy, and the medical man has entered only recently an area which has belonged to the priest. Modern psychotherapy has to be experimental religion, experimental philosophy, experimental sociology, and experimental biology, all at the same time.

Can we psychiatrists intervene or control this phenomenon? We may be a new species, but also we may be only of episodal significance. (Lewis rightly advises us to maintain symbiosis with the psychologist; but for this to be done on any large scale there may have to be a radical change in the curriculum of the medical graduate and the diploma course on the one hand and of the clinical psychologist and sociologist on the other.) Active competitors in our struggle for existence are the priest, with his advancing front of religious psychotherapy; the philosopher, with existentialist analysis; the sociologist and the educationist, working out their ideas of the Welfare State education; and the biologist, using indoctrination, reconditioning, suggestion, tranquillisers—and what may follow. As Lewis says, the scientific discipline and the discipline of historical sciences are being applied with credit by psychiatry and allied sciences. But I suggest there is another discipline, equally necessary at present—namely, self-discipline. In fact, from one standpoint one might define psychotherapy as mutual training in self-discipline by a previously self-disciplined and skilled therapist.

This brings us to the question whether it is possible for all the groups engaged in psychotherapy, in its broad and historical sense, to analyse themselves, as groups. Is it likely that the reductive schools as well as the perspective schools, the biosocial workers and the workers in psychometry, the existentialist analysts, and the religious schools, will either analyse themselves, or be willing to reflect upon and accept the other schools' interpretation of their attitudes? Will they get over their ego-defence resistances—in some cases their pride and prejudice? After attaining a total scientific attitude, will they sit around one table in sessions of leaderless groups to share each other's experiences, make further observations as groups and correlate their hypotheses, like the cybernetic school? Such a group, more widely based and including the cybernetic school, might find itself working at the level of man-in-time and not merely at the level of a biophysical machine.

Hospital for Mental Diseases,
Ranchi (Bihar), India. D. SATYA NAND.

1. Lewis, A. J. *Lancet*, 1958, *i*, 171, 227.

HYPERPYREXIA IN ENCEPHALITIS TREATED BY HYPOTHERMIA

SIR,—We were interested in the account by Dr. Johnston and his colleagues (Sept. 27) of the successful treatment of hyperpyrexia in encephalitis by hypothermia. They state that they were unable to find any reference to the use of hypothermia in this complication of encephalitis.

In November, 1957, we presented a similar patient at a clinical meeting of the Neurological Section of the Royal Society of Medicine, the case being mentioned by abbreviated title in the *Proceedings*[1] without reference to the methods of treatment used.

A man aged 26 had an attack of influenza, made an apparent recovery after 5 days, but on the 7th day developed post-infective encephalitis and was eventually admitted to the London Hospital, under one of us (R. A. H.), on the 9th day after the original attack of influenza. The patient was in semicoma and, although treated with cortisone in large doses, developed a petechial rash, decerebrate rigidity, and Cheyne-Stokes respiration; and 6 hours after starting cortisone therapy his temperature had risen to 105·2°F.

The patient was cooled using the hypothermia machine, in combination with pethidine and chlorpromazine, and his temperature was reduced to physiological levels, cortisone treatment being continued. No attempt was made to produce true hypothermia. After 3 days of cooling the patient was conscious but hallucinated, and 2 days later his level of consciousness had returned to normal and there were no abnormal signs in the nervous system.

Complement-fixation tests on the patient's serum indicated a recent infection with influenza virus A, the illness occurring during the epidemic of "Asian" influenza.

At the time we advocated the use of cooling in order to reduce cerebral metabolism; and because it is known[2] that hypothermia reduces brain volume and a diminution in the amount of cerebral œdema might improve the patient's condition.

Accurate prognosis is always very difficult in encephalitis, since seriously ill patients may recover spontaneously. However, we considered that our patient was likely to die in view of the decerebrate rigidity and hyperpyrexia. At the time we felt it difficult to separate with any confidence

1. *Proc. R. Soc. Med.* 1958, **51**, 16.
2. Rosomoff, H. L. *ibid.* 1956, **49**, 358.

the possible beneficial effects of cortisone and cooling, although the deterioration in the first 6 hours of cortisone therapy, and the immediate improvement after the patient's temperature had been reduced to normal levels, suggested that the cooling played a role in his ultimate complete recovery.

P. B. CROFT
The London Hospital, E.1. R. A. HENSON.

SUSCEPTIBILITY TO VIRUS INFECTION AFTER ANTIBIOTIC THERAPY

SIR,—The incidence of certain virus diseases, such as hepatitis, infectious mononucleosis, and coxsackie infections is steadily increasing. The parallel between the increase in antibiotic consumption and the increase in these infections could be a coincidence, but the fact that antibiotics may induce unfamiliar syndromes by eliminating normal bacterial flora suggests that something similar may be happening in certain sporadic virus diseases.[1]

Antibiotic therapy influences directly the production of antibodies, but it is not certain whether this influence is due to the early elimination of bacterial antigens [2 3] or to an interference with the antibody-producing apparatus.[4] Antibiotics seem to interfere with certain enzyme activities in cells (utilisation of vitamins, modification of cholinesterase activity, &c.),[5] which might be taken as support for this second hypothesis. We investigated, therefore, the change in agglutinin titres, neutralising capacity, and electrophoretic patterns in healthy rabbits during antibiotic therapy and after active immunisation with type-3 adenovirus.

32 rabbits were divided into five groups. The first group was treated with penicillin or streptomycin (30,000 units and 15 mg. per kg. body-weight per day) for three weeks. The cold agglutinins and agglutinins against sheep's red cells were determined before and after the course of antibiotics. The second group was immunised with adenovirus, and the neutralising power of the serum was estimated at the end of the immunising period. In the third group the antibiotics were given during immunisation, and the animals in the fourth group received the antibiotics after immunisation. The last 5 rabbits served as controls. Changes in the plasma-proteins and lipoproteins were determined by paper electrophoresis.

The sources of errors were considerable, and we interpreted the results with great scepticism. Several facts seem, however, to suggest that antibiotics do influence the susceptibility of the organism to virus infection. The following points merit further investigation:

(1) The cold and sheep-cell agglutinin titres increased after antibiotic therapy.

(2) The adenovirus-neutralising titre of the serum of healthy rabbits was reduced when the immunisation was performed parallel with antibiotic therapy or when penicillin or streptomycin was given after immunisation.

(3) The albumin fraction of the serum-proteins increased after antibiotic therapy, which accords with earlier observations.[6]

(4) The α-lipoproteins decrease and the β-lipoproteins increase during penicillin or streptomycin treatment. The lipoproteins are thought to play a part in the defence of the organism against virus infections.[7]

The increase in the cold and sheep-cell antibodies suggests that antibiotics may encourage a resynthesis of virus particles, as is the case with tobacco mosaic virus [8] or experimental hen leukæmia. Sporadic virus infections may conceivably be due to an event which induces such a resynthesis, and the reconstituted virus entity may eventually gain in virulence by repeated passages. Our further investigations will try to establish whether similar changes can be detected in man.

A more detailed account of our results was given at the World Congress of Prophylactic Medicine in Gmunden on Sept. 8, and the work will be published elsewhere.

L. MOSONYI
TH. CSIKY
A. LENGYEL
G. RÉTSÁGI
I. BALÁZSI
P. SZEMERE.
II Medical Clinic and Microbiological Department, University of Budapest.

CLEANING OF GRIMY WOUNDS

SIR,—Cleansing of the skin, especially of the hands, before the treatment of accidental wounds, is often difficult when the skin is soiled by paint, oil, or grease mixed with dirt. I have found that a solvent jelly (a mixture of sodium oleate and a hydrocarbon solvent) is a very satisfactory cleansing agent, far superior to soap and water, ether soap, essential oils, such as terebinth, or solutions of cetrimide. It causes little or no pain on application and we have not noticed any delay in wound healing or any allergic reactions.

Usually the patient is given some of the jelly and, after working it well into the hands, he rinses it off under running water. Alternatively, the operator can spread the material with a swab when the grime is easily wiped off, and the area is then rinsed with water.

As an aid to dispensing, the jelly is kept in a pliable polyethylene bottle, closed by a screw cap fitted with a nozzle. The dispenser is filled by aspiration from a $3^1/_2$ lb. tin after squeezing the air from the bottle.

The jelly is marketed under the trade name of 'Dirty Paws' by Kay Bros. of Reddish.

General Hospital, Ashton-under-Lyne. A. WILKINSON.

INCOME-TAX RELIEF FOR DEFENCE SOCIETIES' SUBSCRIPTIONS

SIR,—Prior to the coming into operation of the Finance Act, 1958, a doctor or dentist whose professional remuneration was assessable to income-tax under Schedule E (remuneration by salary) was not normally allowed relief for his annual subscription to his defence society.

The Commissioners of Inland Revenue have now approved the Medical Defence Union, the Medical Protection Society, and the Medical and Dental Defence Union of Scotland for the purposes of Section 16 of the Finance Act 1958, and the whole of the annual subscription paid by a member who qualifies for relief under that section will be allowable as a deduction from his emoluments assessable to income-tax under Schedule E.

Practitioners assessed under Schedule D already enjoy this concession but a member of a medical defence society who holds a salaried appointment should apply to his tax office without delay for Form P.358 on which to make a claim for adjustment of his pay-as-you-earn coding.

ROBERT FORBES
Secretary, Medical Defence Union
ALISTAIR FRENCH
London. Secretary, Medical Protection Society.
C. C. MILLAR
Secretary, Medical and
Glasgow. Dental Defence Union of Scotland.

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Parliament

Provision for Old Age

SPEAKING in the debate in the House of Lords on Dec. 3 Lord BEVERIDGE admitted that he was almost equally unhappy about the Government scheme and the Labour Party scheme for old-age pensions. Both departed from the principle of treating all men equally in social insurance, irrespective of their rates of wages.

His chief criticism of the Government scheme was that it failed to guarantee a subsistence allowance as of right for all. No existing pensioner got more than £2 10*s*. a week for himself and £1 10*s*. a week added for his wife; nobody earning £9 a week, or less, in future would get more than that same sum—and that was the category that had to be supplemented by public assistance today in one case out of four. His criticism was based on present prices, and the scheme did not mention the problem of inflation and made no provision against it. It also failed to tackle the difficult problem of transferability in occupational schemes. As he understood the scheme, the people who paid the larger graded contribution would not get the whole benefit of that extra contribution. Some of the money would be used to maintain the finances of the scheme as a whole. In other words, it was a financial scheme even more than a pension scheme.

Lord Beveridge's main reason for disliking the Labour Party's scheme was that it threw a burden of contributions on earners which would prove insupportable to most of them unless they demanded higher earnings as compensation. In other words, it looked to him a direct incentive to more inflation. He believed that the stabilising of money was a duty of the Government, second only to that of securing peace and order, because money was the instrument by which each of us managed his own life. If the individual was to be free to decide when to spend and when to save, money must be stable. Provision for old age would be the greatest social problem of our nation for a generation and more ahead. It was a double problem—that of providing for the old and that of not ruining everybody else either by taxation or by inflation.

Nuclear Hazards

THE Nuclear Installations (Licensing and Insurance) Bill, which is now before the House of Lords, includes provisions for compensation for personal injury due to radioactivity. At the committee stage on Dec. 2, Lord TAYLOR moved an amendment to remove the proposed 10-year limit within which claims should be made. He realised the Government's difficulty in attempting to legislate for the unknown, but he pointed out that the greatest hazard of a disaster at a nuclear plant was probably the liberation of radio-strontium. Radio-strontium had a half-life of 28 years and when picked up by the body would remain active for a still longer period. Moreover, the effect of radiation on bone-marrow appeared to be cumulative, and once it had been damaged a further radiation, harmless in itself, might precipitate disaster. The effects of radio-strontium were admittedly unknown, but the effect of X rays in their early days on unprotected workers was probably a useful guide, and we knew that it might take 27 years before the fatal effects of X-ray radiation were manifest. He suggested, therefore, that a more reasonable time-limit for claims by people exposed to nuclear hazards would be about 30 years. Another nuclear hazard was radio-cæsium, which remained active even longer than radio-strontium and which might continue to be a risk throughout the entire procreative life of the individual.

Lord MILLS, the Minister for Power, defended the 10-year limit on the ground that the longer a claim was delayed the more difficult it would be to establish the cause of the injury. Moreover, a 10-year period was favoured by other member countries of the Organisation for European Economic Cooperation and was likely to be adopted by a European convention on the insurance of nuclear risks. He agreed that it could be argued that 10 years was not long enough to cover all possible causes of injury, but it should be long enough to cover those capable of proof. Lord SILKIN thought that, however difficult it might be to prove a claim, a claimant should not be barred from making it. Other Noble Lords agreed, and Viscount HAILSHAM, the Lord President of the Council, intervened to say that the Government would reconsider the matter on its merits before the next stage of the Bill.

QUESTION TIME

Expenditure on Medical Research

Mr. ARTHUR BLENKINSOP asked the Minister of Health, as representing the Lord President of the Council, whether he was satisfied with the amount of funds at present available for medical research; and what action he proposed to take to improve the situation.—Mr. DEREK WALKER-SMITH replied: Over the past ten years expenditure by the Medical Research Council has been more than trebled. The Council's resources are reviewed sympathetically each year in the light of new developments and new needs. Mr. BLENKINSOP: Is the Minister not aware of the disquieting information about the number of specialists who are going over to the United States to do particular research because of the lack of resources in this country? Will he not carry out further investigations in view of the great desire that these very eminent men should, if possible, be enabled to do their work in this country?—Mr. WALKER-SMITH: I am sure that my noble Friend will have regard to what the hon. Gentleman has said. The trend of resources available and of expenditure is, in fact, an upward and satisfactory one.

Clinical Experiments

Mr. S. T. SWINGLER asked the Minister if he had considered the report of a clinical experiment in which mentally defective children in hospital were used as matched controls; whether parental consent was obtained before the children were so used; and what assurances were given that no harmful effects would result.—Mr. WALKER-SMITH replied: I have seen the report, and I regret to find on inquiry that parental consent was not obtained as it should have been before the drug was administered. I am assured that a single dose as given in this case has no harmful effects.

Mr. SWINGLER: Did not the Minister note during the debate in the House in February, 1945, that I drew the attention of the then Minister of Health to a similar case of children in hospital being used as "guinea pigs" for scientific experiments involving the injection of drugs without there being any parental consent? Is not this very wrong, and, as this is the second case which has occurred, should not the Minister issue some guidance to hospital authorities, as there are many who have the strongest possible objection to children being used in this way, especially when adults can volunteer for the purpose?—Mr. WALKER-SMITH: Guidance has been issued on this matter in the form of a Medical Research Council memorandum. In regard to adults, in this case the drug was in fact first tried out on the doctors who were to carry out the trials on the children.

Mr. SWINGLER asked the Minister to what extent his regulations permitted the use of children in hospital for clinical experiments with or without parental consent.—Mr. WALKER-SMITH replied: Investigations of this kind involve medical and ethical problems which are not susceptible of control by regulations. It is, however, my view that parental consent should be obtained, and I will draw the attention of responsible officers of hospital boards to this matter again. Mr. SWINGLER: Is it not regrettable that this case should have occurred, in view of the fact that the previous Minister of Health gave the same reply about two and a half years ago about parental consent being obtained if such experiments were necessary? Will the Minister now make this instruction very emphatic to hospital authorities so that no further cases may occur?—Mr. WALKER-SMITH: I will certainly try to ensure that the requirement is brought to the notice of all concerned. Having said that, I reiterate that no harm was done and that this was a valuable and useful experiment.

Mr. CHRISTOPHER MAYHEW: While the Minister very rightly agrees to look carefully at this point, may I ask him to

bear in mind that a number of very promising research projects involve free access to patients? While he will look carefully at the matter, may I ask that he will not prejudice the success of those very important researches?—Mr. WALKER-SMITH: My general policy, in harmony with that of the Medical Research Council, is that there should be the greatest possible freedom from detailed supervision in clinical research in hospitals. I do not regard that as incompatible with abiding by the view I have expressed about parental consent for these cases.

Senior Registrars

Mr. KENNETH ROBINSON asked the Minister if he would make a statement on the present position regarding time-expired senior registrars, indicating what proportion had been recommended for and had received permanent appointments.—Mr. WALKER-SMITH replied: Hospital boards have so far formulated proposals for 24 designated posts of which 2 are about to be approved and 22 are under consideration. Mr. ROBINSON: Is that not a very small proportion of the whole? Why is progress so slow? Does the Minister not appreciate that a very great deal of anxiety and hardship is entailed?—Mr. WALKER-SMITH: It has always been envisaged that there would be only a limited number of designated posts. In regard to slow progress, it is a fact that 2 regional hospital boards and 5 boards of governors have not as yet replied.

Teaching Hospital at Fulham

Mr. MICHAEL STEWART asked the Minister what proposals he had received from the governors of Charing Cross Hospital concerning the size of the teaching hospital which it is proposed to establish in Fulham.—Mr. WALKER-SMITH: I have received the board's proposals, which involve providing 1082 beds. These proposals will now be considered and discussed with the board as soon as possible. Mr. STEWART: Is the Minister aware that the governors have expressed the view that something like that number of beds will be required if the hospital is both to perform its teaching function and meet the needs of the locality?—Mr. WALKER-SMITH: The basis of the figure will, of course, have to be studied with the board of governors and the regional hospital board. We are seeking to provide in this new Charing Cross Hospital a service for the Fulham area which will compare favourably with that which the rebuilt Fulham Hospital would have given. Mr. STEWART: But will the Minister recollect that when this matter was discussed earlier his parliamentary secretary spoke of a hospital having something like 700 or 800 beds, and that that smaller figure caused a good deal of alarm?—Mr. WALKER-SMITH: My advisers have hitherto taken the view that a smaller number than the figure at present put forward by the board of governors would be appropriate That is one of the things which we must study together in looking at the plans.

Marriage Guidance

Mr. E. G. FLETCHER asked the Home Secretary if he would increase the Government grant to the National Marriage Guidance Council, in view of the fact that it urgently needed more money to continue its work of preventing broken homes? Mr. R. A. BUTLER replied: I attach great importance to the work of the Council and the other organisations engaged in marriage guidance, and I intend to propose to Parliament in due course that the grants shall be increased by 50% in the financial year 1959–60.

Poliomyelitis Vaccine Booster Dose

Mr. SOMERVILLE HASTINGS asked the Minister of Health for what proportion of children under 15 years of age, who had had two injections of poliomyelitis vaccine, the parents had agreed to a third some months later.—Mr. WALKER-SMITH replied: Third injections started only this autumn, and by the end of October nearly 250,000 had been carried out. This represented about a tenth of the children who had had their second injection seven months or more before that date.

Mr. HASTINGS: If there is clear evidence that for the best results a third dose is necessary, and now that there appears to be an abundance of the vaccine available, cannot the Minister exercise more pressure so that more than 250,000 children receive the boosting dose at the right time—that is to say, about six or seven months after the primary dose?—Mr. WALKER-SMITH: The recommendation is that the vaccine should be offered not less than seven months after the second injection, but it has been found that a good response is obtained to a third injection given after a much longer interval. I am, of course, anxious that the third injection should be given, but the joint committee on polio vaccine has recommended that the vaccination of all people eligible with two doses should take precedence over a third injection. I am particularly anxious to get the remaining children vaccinated with two doses.

Obituary

JAMES ANDREW CRAIG

M.D. Belf., F.R.C.S.

Mr. J. A. Craig, consulting ophthalmic surgeon to the Royal Victoria Hospital, Belfast, died on Nov. 26.

He was born in 1871 at Ballymoney, Co. Antrim, and received his early education in Coleraine Academical Institution. He later passed on to Queen's College, Belfast, graduating in the Royal University of Ireland in 1895 with first-class honours. His postgraduate experience was gained in various hospitals in the British Isles and he was one of that small, but exemplary, group who sat at the feet of the teachers of the Vienna Medical School at the end of the last century. In 1902 he obtained the F.R.C.S. of England and in 1905 he was invited to fill the post of assistant surgeon in the ophthalmology unit of the Royal Victoria Hospital, eventually becoming the senior surgeon to the developing department of ophthalmology and nose and throat diseases in the most important hospital in Belfast during a most active phase of expansion and growth. In 1913 he was invited to accept the post of lecturer in ophthalmology and otology in the Queen's University (as it had now become) of Belfast in succession to Mr. Cecil Shaw. These posts he held until 1937 when he retired on reaching the age-limit.

During his professional life he was recognised as an outstanding clinician; he was much in demand as a consultant and was often the final arbiter in making the ultimate decision on diagnosis or treatment. As a surgeon he was a supreme technician, beautiful in his wielding of instruments, dexterous in dealing with delicate structures and tissues. While he could not 'suffer fools gladly' he had a sincere human touch in his relations with patients and there are many who owe their eyesight or physical welfare to him and acknowledge with gratitude their debt to his skill and judgment.

He was a past-president of the Ulster Medical Society and of the Irish Ophthalmological Society; he was also a member of the Oxford Ophthalmological Congress, of the Société Français d'Ophtalmologie, and of the Ophthalmological Society of the United Kingdom. During the war of 1939–45 he returned from retirement to assume full duty once more in the Royal Victoria Hospital to relieve the pressure upon those who continued to run the department when much depleted of staff. In 1951 he was given the degree of M.D. (hon. causa) in Queen's University in recognition of his eminence and services to the university.

James Craig enjoyed golf and the friendships of the Royal County Down Golf Club of which he was a past-captain. Skiing and skating were among his sporting activities in earlier days. He was also a member of the Ulster Club in Belfast where he enjoyed meeting lay and professional members at the dining-table or in the bridge room. One would say truthfully that he had a wide circle of friends and acquaintances but only a small number of intimates who were privileged to enjoy the sociability of his home and the personal reminiscences of a life full of wide interests. He had a love of the sea and ships, and in fact accepted a post in a certain ward of a hospital because from its elevated position he could see the ships passing up and down a busy river. The intervening years took him on many voyages to places abroad—South America, the

Middle and Far East, and the Atlantic islands. On retirement he selected for his new home a house on the shore of Belfast Lough where the ships that passed in and out of the port were a source of continued interest.

His wife died some years ago and he is survived by two sons.

F. M. B. A.

DR. F. G. LESCHER

R. E. S. writes:

" In your obituary of Graham Lescher, whom I have known for over thirty years, you rightly stress his keenness on his hospital work, and earlier on his general practice. It was perhaps his ability to take great interest in whatever he was doing that made him a good doctor. This is well illustrated by his writing, while he was a prisoner-of-war, his M.D. thesis on the work of a field ambulance. Sir Clifford Allbutt, then the regius professor of physic at Cambridge, wrote saying this was an unsuitable subject, but Lescher replied that it was the only one about which he could write while in captivity. Thereupon it was accepted. Sir Clifford sent a gracious note saying this was the first time a P.O.W. had written a thesis for the Cambridge M.D. since the Civil War."

Diary of the Week

DEC. 14 TO 20

Sunday, 14th

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
10.15 A.M. Mr. C. Gill-Carey: Common E.N.T. Conditions.

Monday, 15th

GUY'S HOSPITAL, S.E.1
5.15. P.M. Dr. P. E. Polani: Anomalies of Sex Differentiation.
HUNTERIAN SOCIETY
8.30 P.M. (Talbot Restaurant, London Wall, E.C.2.) Sir Vivian Fuchs, Dr. O. G. Edholm: Human Endurance.

Tuesday, 16th

ROYAL ARMY MEDICAL COLLEGE, Millbank, S.W.1
5 P.M. Dr. J. G. Scadding: Sarcoidosis, Diagnostic Aspects.
ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, 9, Queen Street, Edinburgh, 2
5 P.M. Prof. Robert Platt, F.R.C.P.: Consequences of Renal Inadequacy. (Sydney Watson Smith lecture.)

Wednesday, 17th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5 P.M. *Comparative Medicine.* Mr. D. E. Bolt: Spontaneous Gastric Dilation in Man. Dr. A. T. Phillipson: Physiological Effects of Distension of the Rumen and the Œsophagus in Ruminants. Dr. J. L. Mangan: Recent Research on Bloat in Cattle in New Zealand.
POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12
2 P.M. Dr. J. M. Barnes: Experimental Study of Toxic Substances.
BRITISH PSYCHOLOGICAL SOCIETY
8.30 P.M. (11, Chandos Street, W.1.) *Medical Section.* Dr. S. I. Abrahams, Dr. V. J. Marmery, Dr. H. S. Passmore, Dr. Michael Balint: The Integrating Role of the General Practitioner.
BIRMINGHAM MEDICAL INSTITUTE, Highfield Road, Edgbaston
8 P.M. *Psychiatry.* Sir John Wolfenden: Homosexuality and the Law.

Appointments

CATTERALL, R. D., M.R.C.P.E.: consultant-in-charge, department of venereology, General Infirmary, Leeds, with duties at St. James's Hospital, Leeds.

ELLIOTT, R. W., M.D., M.SC. Sheff., D.P.H.: M.O.H. and principal school M.O., West Riding of Yorkshire.

ROSS, D. N., M.B. Cape Town, F.R.C.S.: assistant thoracic surgeon, Guy's Hospital, London.

WALKER, A. SMITH, L.R.C.P.E., D.L.O.: assistant director, audiology unit, Royal National Throat, Nose, and Ear Hospital, London.

WYLIE, J. A. H., M.D. Lond., D.PHIL.: research bacteriologist, department of bacteriology, Brompton Hospital, London.

The Hospital for Sick Children, Great Ormond Street, London:

CASTLE, J. L., M.B. Sydney, F.R.C.S.: house-surgeon.
DRAKE, JEAN E., M.B. Lond., D.C.H.: house-physician.
HAWKEN, M. J., M.B. Lond.: house-surgeon.
STRELLING, M. K., M.B. Lond., D.C.H.: house-physician.

Manchester Regional Hospital Board:

LORIMER, ALAN, M.B. Aberd.: assistant pathologist (S.H.M.O.), Salford Royal Hospital.

SEQUEIRA, P. G. L., M.B. Lond.: consultant pathologist, regional V.D. serology department, Withington Hospital, Manchester.

STARCZEWSKI, R. W., M.B. Edin.: assistant psychiatrist (S.H.M.O.), Prestwich Hospital, Manchester.

Notes and News

CHRISTMAS OPPORTUNITIES

THE progress of civilisation is often charged, not altogether unjustly, with turning Christmas from a simple family festival into a complex global frenzy. It has become too big, too commercial, too impersonal, too quick, too bogus we cry as we meet yet another over-effusive Father Christmas with a supersonic sledge. But the contemporary Christmas has its merits, too. The commercial and the impersonal can happily revert to the voluntary and the personal, and we are able to combine the contemporary practice of broadcasting Christmas cards with the old-fashioned one of helping the old, the young, the sick, and the unhappy. The cards which we have received this year, some of which are listed below, suggest that there is much to be said for this version of Christmas goodwill.

Some of the cards sent by UNICEF (14, Stratford Place, London, W.1) appropriately show festive times in other lands and children bearing gifts (10 cards for 7*s.* 6*d.*). The National Marriage Guidance Council (78, Duke Street, W.1) have reprinted a *Nativity* by the late John Minton. Their other cards include an attractive design for *The Twelve Days of Christmas* by Joan Hassall. (Their prices range from 3*s.* to 8*s.* a dozen.) The National Association for Mental Health (39, Queen Anne Street, W.1) have two new cards. Sydney Cockrell's *Shooting Star* is exclusive to the association (10*s.* 2*d.* a dozen). Dürer's owl, though not exclusive, is very endearing (6*s.* 9*d.* a dozen). The Grenfell Association (66, Victoria Street, S.W.1) have added five new cards to their now considerable collection. The most original is an expanding set of coloured cutout figures of the children of Labrador which costs 8*d.*

The National Association for the Prevention of Tuberculosis (Tavistock House North, W.C.1) have chosen a new design for their seals this year—100 British flowers (4*s.* per 100). A key of the names of the flowers may be had on request. The National Spastics Society (28, Fitzroy Square, W.1) have also new designs and are asking people to give 1*d.* for each seal they use.

POPULATION AND FAMILY PLANNING

POPULATION problems and family planning was the theme of a conference for senior students from overseas held on Nov. 28 and 29 in Edinburgh. The first of a series of two-day conferences to be held in university and other towns in Britain under the auspices of the International Planned Parenthood Federation, it was attended by some 160 medical and other students from as far afield as Venezuela and Japan.

Prof. W. L. M. Perry was chairman. Papers were given on population problems (Dr. R. Passmore), maternal problems (Prof. R. J. Kellar), the human family (Prof. R. W. B. Ellis), the changing status of women (Mr. A. H. Richmond), the value put upon children in different communities (Dr. Sidney Collins), and methods of family planning suitable for overseas (Dr. Eleanor Mears). A Japanese film *Family Planning in our Village* showed the story of the fishing village of Fukuura-Mura which, following a pilot project by the Japanese Institute of Public Health, halved its birth-rate in seven years. The conference ended with a discussion on such questions as religious attitudes towards family planning; the effect of family planning on the kinship group; the ideal spacing and number of children; the harmlessness and effectiveness of modern methods of contraception; and whether diet and climate affect fertility.

ADMINISTRATIVE REORGANISATION AT OXFORD

WITH Lord Nuffield's benefaction of £2 million to the University of Oxford in 1936 a Nuffield Trust was set up to " promote the progress of medical knowledge " by founding a postgraduate medical centre with the five Nuffield professorships in clinical medicine, surgery, obstetrics and gynæcology, anæsthetics, and orthopædic surgery, and the Nuffield Institute for Medical Research. When the war-time expedient of a clinical school became a permanent part of the declared policy of the university, the Nuffield Committee administering this trust was enlarged and also became responsible for the clinical school and its complex relations with the university, the Oxford United Hospitals, and the Oxford Regional Hospital Board. This year Lord Nuffield wrote to the Vice-Chancellor expressing his concern at this development and reminding the university of the prime objects of his benefaction.

To meet his wishes the university proposes to set up a Committee for the Advancement of Medicine to look after the development of the medical school, both in research and in the training of postgraduate students and of a limited number of clinical students reading for the B.M. degree, and to be responsible for the expenditure of the clinical section of the school. A subcommittee will form a Nuffield Committee for Medical Research and Postgraduate Training and will administer the Nuffield Trust Fund for research and the training of postgraduate students. It will submit an annual report and accounts to the Nuffield trustees. As less than 5% of the time of the Nuffield professors and of the director of the Nuffield Institute for Medical Research has been spent in clinical teaching, comparable to the undergraduate teaching of the university demonstrators in the science departments, this reorganisation is expected to make little difference to their work. The medical faculty feel that an active clinical school is the best basis for a thriving postgraduate and research centre and hope that by this change both will be achieved.

University of Cambridge

The Raymond Horton-Smith prize has been awarded to Dr. R. W. R. Russell of Trinity Hall.

On Nov. 29 the degree of M.B. was conferred on Susan J. de Graaff-Hunter.

University of Sheffield

On May 12 the honorary degree of LL.D. will be conferred on Prof. Robert Platt and of D.SC. on Sir Hans Krebs.

National University of Ireland

University College, Cork.—Dr. R. D. Coakley has been appointed to a lectureship in pathology, and Dr. J. D. Sheehan to a lectureship in pharmacology.

Royal College of Physicians of London

On Tuesday and Thursday, Jan. 20 and 22, at 5 P.M. at the college, Pall Mall East, S.W.1, Prof. W. S. Peart will give the Goulstonian lectures. His subject will be hypertension and the kidney.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting on Dec. 1, with Mr. Arthur Jacobs, the president, in the chair, the following were admitted fellows of faculty, *qua* physician:

Pagadala Damodaram, Theodore Douglas Grant, Iwo Robert Waclaw Lominski, Angus MacNiven, Ismail Ramzy, Mohamed Abu Shoke.

The Royal Society

At the anniversary meeting of this society on Dec. 1, Sir Cyril Hinshelwood was re-elected president. Elections of medical fellows included Sir Lindor Brown as biological secretary, and Sir Charles Dodds and Prof. Wilson Smith as members of the council.

Awards under the Commonwealth bursaries scheme of the society and the Nuffield Foundation have been made to Dr. P. R. Davis, lecturer in anatomy, Royal Free Hospital School of Medicine, London, and Dr. A. Iggo, lecturer in physiology, University of Edinburgh.

James Yearsley Lecture

On Friday, March 6, at 5.15 P.M., at the Royal Society of Medicine, 1, Wimpole Street, London, W.1, Dr. Karsten Kettel, of Hillerod, Denmark, will give this lecture. He is to speak on surgery of the facial nerve in atraumatic facial palsies.

International Congress of Gastroenterology

This congress will be held in Leiden from April 20 to 24, 1960. Further particulars may be had from the congress office, department of gastroenterology, University Hospital, Leiden, The Netherlands.

British Association of Physical Medicine

The annual meeting of this association will be held at Guy's Hospital, London, S.E.1, on Friday and Saturday, April 17 and 18. Further particulars may be had from the hon. secretary, Dr. A. T. Richardson, 47, Lincoln's Inn Fields, W.C.2.

Heberden Society

This society's annual dinner was held at Apothecaries' Hall on Dec. 5, when Prof. J. H. Kellgren, the president, presented the Heberden medal to Dr. Charles Ragan, of New York, who had earlier delivered the Heberden oration.

Proposing The Society, Sir Harold Himsworth said that Heberden was renowned alike for his contributions to medicine, for his knowledge, and for his kindness and generosity. Samuel Johnson (who had not met the present members of the Heberden Society) had called him the last of the learned physicians; and his genius for controversy was such that if he had been alive today he would have been one of the leaders of the profession. Certainly, if he had been alive, he would have approved the society and what it was doing to advance knowledge. Professor Kellgren, responding, did not quite like its description in the annual report as a " clinical and scientific " society: " is it possible that we have clinical activities which are not scientific? " The first function of the society was to make discussion on rheumatology more scientific. Reflecting on current work on connective tissue, he foresaw an important break-through when laboratory studies and clinical studies came together in a workable synthesis.

Dr. F. Dudley Hart, in giving a more than tolerant welcome to all The Guests, pointed to the strange fact that Sir Geoffrey Jefferson was not an honorary member of the neurosurgical societies of Alaska and Tibet—partly no doubt because he had no need for heights but mainly perhaps because there were no such societies. Sir Geoffrey said that even the transient visitor noticed the society's friendly and informal feeling—" which is how things should be in scientific circles ".

General Medical Practice

Cambridge University Medical School will hold a symposium on this subject at the Department of Human Ecology, Fenner's, Gresham Road, Cambridge, on Feb. 14 at 10.30 A.M. The speakers will include Lord Taylor, Prof. A. Leslie Banks, and Dr. G. E. Godber.

International Tuberculosis Conference

This conference will be held from Sept. 11 to 18, in Istanbul. The speakers will include Sir Clement Price Thomas and Prof. Robert Cruickshank. Further particulars may be had from the secretariat of the International Union Against Tuberculosis, 15, Rue Pomereu, Paris 16e.

Computers in Medical Diagnosis

The possibilities of using modern computers as an aid in medical diagnosis will be the subject of a conference at the Rockefeller Institute, New York, on Jan. 14. Those who have been invited to attend include doctors, computer programmers, electronic engineers, biophysicists, and hospital administrators.

Royal Commission on Remuneration

The Royal Commission on Doctors' and Dentists' Remuneration will hold public hearings on Friday, Dec. 12, in Edinburgh, when representatives of the Scottish Medical Practices Committee and the Association of Scottish Executive Councils have been invited to attend.

Medical Women's Federation

Christine Murrell fellowship (*£150*).—The Federation invites applications for this award from women doctors. Full details will be found in our advertisement columns.

Prof. J. M. Munro Kerr received congratulations from the council of the Royal College of Obstetricians and Gynæcologists on the occasion of his 90th birthday on Dec. 5.

Surgeon Captain J. C. Gent has been appointed an honorary physician to the Queen in succession to Surgeon Rear-Admiral R. L. G. Proctor.

Prof. W. Melville Arnott will be in Northern Nigeria from Jan. 24 to March 6 as a medical visitor for the Colonial Office.

The department of Child and Family Psychiatry, Ipswich and East Suffolk Hospital, will hold a refresher course for doctors from March 16 to 20. Further particulars may be had from the department, 11, Fore Street, Ipswich.

Prof. Ian Aird asks us to state that an article containing his name, which appeared on Nov. 23 in a Sunday newspaper, was prepared and published without information from him and without his knowledge; nor did he furnish the illustrations for it.

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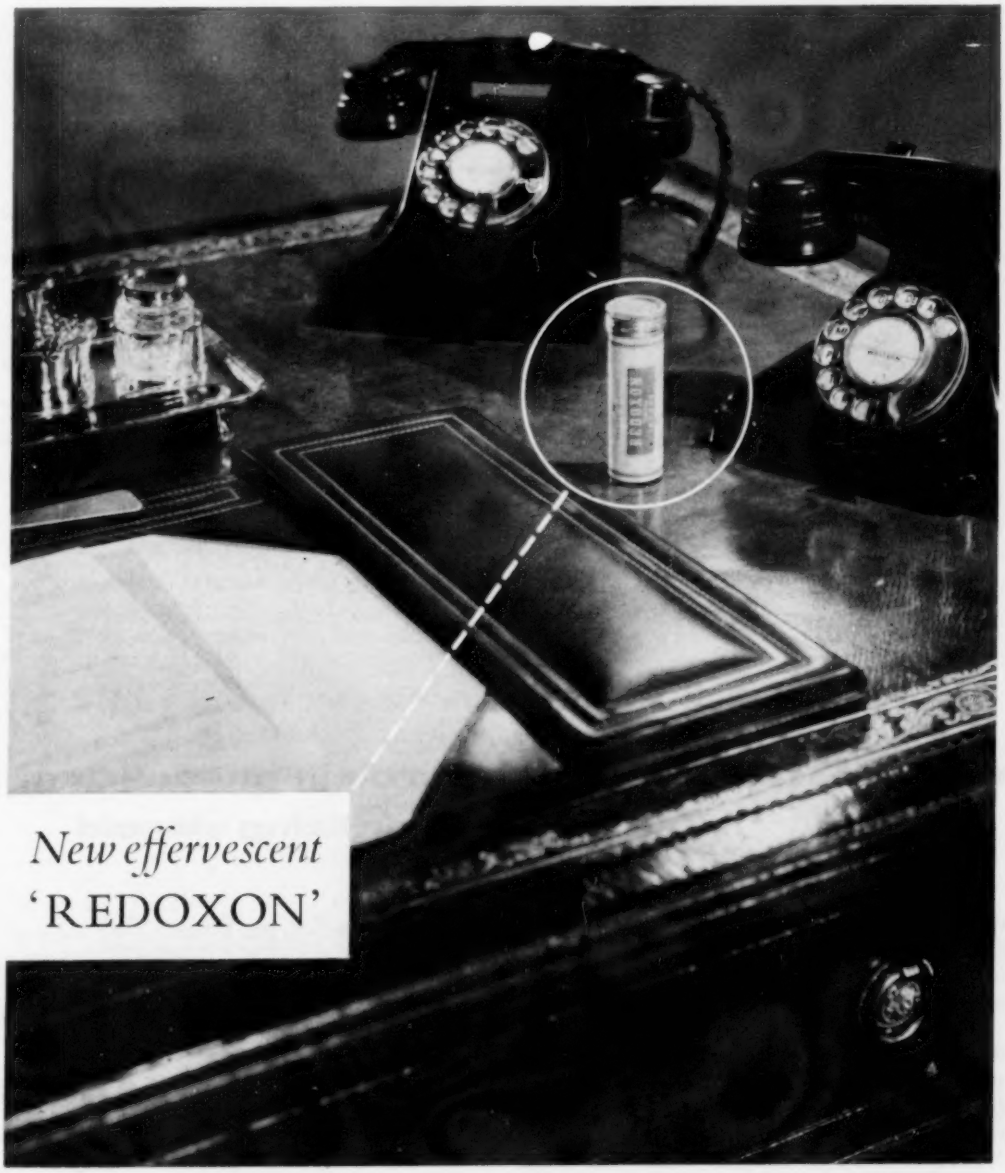

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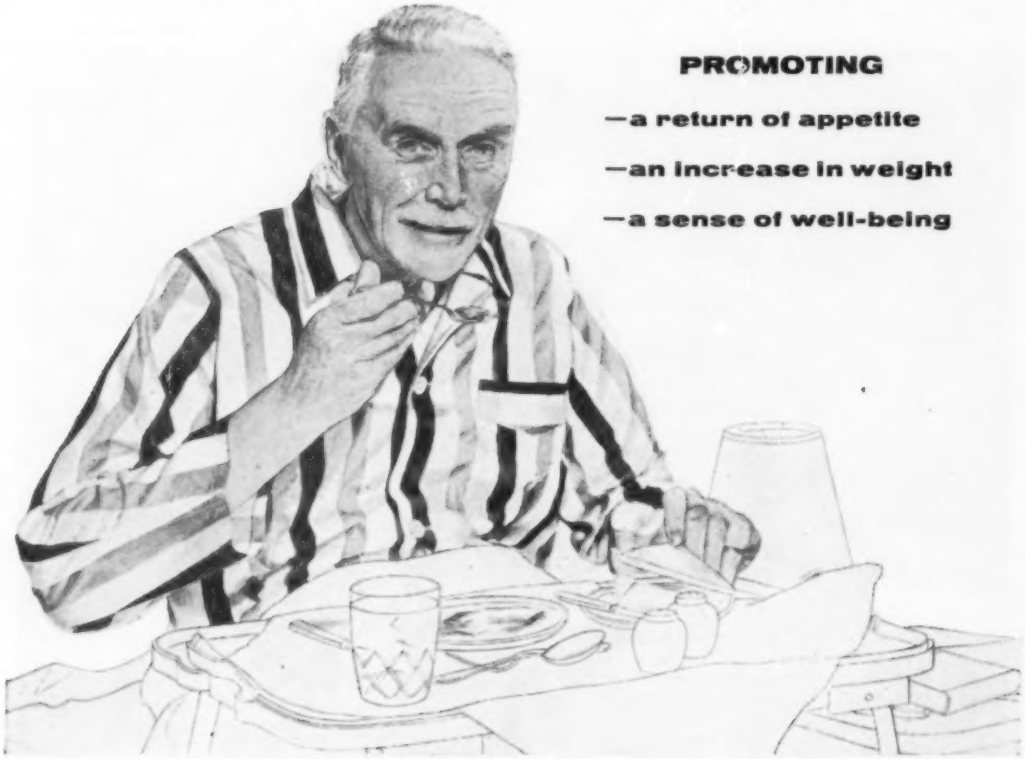

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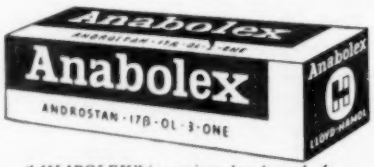

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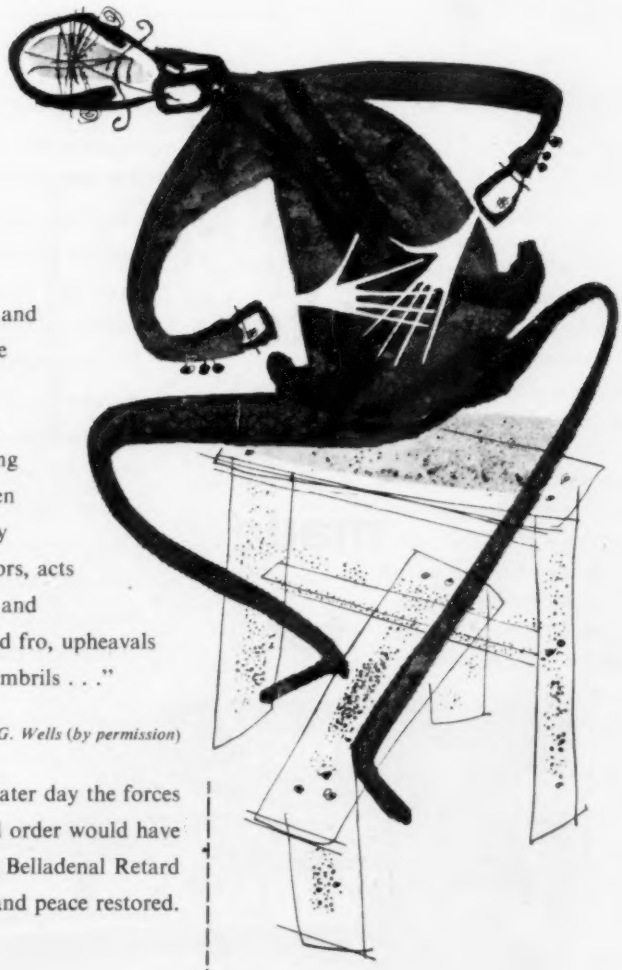

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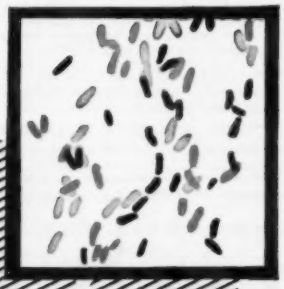

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The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

FACULTY OF ANÆSTHETISTS
of the
ROYAL COLLEGE OF SURGEONS OF ENGLAND

BOARD OF FACULTY ELECTION

NOTICE is hereby given that an election of 2 Fellows in the Faculty to the vacancies on the Board occasioned by the retirement in rotation of Mr. A. D. MARSTON, C.B.E., and DR. R. F. WOOLMER will take place at the College on WEDNESDAY, 11TH MARCH, 1959, at 2.30 P.M. The following shall be eligible for election to the Board on complying with the conditions of the Regulations:—

(*a*) All Fellows in the Faculty by election, provided they have been medically qualified for 15 years;

(*b*) All Fellows who have been medically qualified for 15 years and Fellows by examination for 10 years.

Application forms of the requisite notice to be signed by the candidate and his nominees may be obtained on application to me, and must be received by me duly completed by 1st January, 1959.

The names of the candidates will be published in the London Gazette and the Medical Journals on or about Tuesday, 20th January, 1959. A voting paper will be sent by post to each Fellow whose address is registered at the College on Tuesday, 20th January, 1959. Fellows are requested to give notice, without delay, of any change of address, so that their voting papers may not be misdirected. R. S. JOHNSON-GILBERT, Secretary.

Lincoln's Inn Fields, London, W.C.2.

FACULTY OF ANÆSTHETISTS
of the
ROYAL COLLEGE OF SURGEONS OF ENGLAND

EXAMINERSHIPS

The Council of the College invite applications for the following Examinerships:—

FELLOWSHIP* IN THE FACULTY OF ANÆSTHETISTS	*Number to be elected*	*Number who seek re-election*
PRIMARY EXAMINATION		
*Anatomy	2	1
*Physiology	2	1
*Pathology	2	1
*Pharmacology	2	0
FINAL EXAMINATION		
†Medicine	1	0
‡Anæsthetics	8	5

*Applicants must hold a medical qualification registrable in this country.

†Applicants must hold a higher degree or diploma in Medicine.

‡Applicants must be Fellows in the Faculty.

Forms of application may be obtained from the Secretary, Faculty of Anæsthetists, Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.2, and must be returned to him by 1st January, 1959. R. S. JOHNSON-GILBERT, Secretary, Faculty of Anæsthetists.

INSTITUTE OF ORTHOPÆDICS
ROYAL NATIONAL ORTHOPÆDIC HOSPITAL,
234, Great Portland-street, London, W.1

A COURSE OF LECTURES on Disorders of Joints will be given in the Lecture Room on FRIDAYS from 6 P.M. to 7 P.M. on the following dates :—

9th Jan.	Infective Arthritis	Mr. H. J. BURROWS
16th ,,	Tuberculous Disease of Joints	Mr. J. A. CHOLMELEY
30th ,,	Chemistry of Synovial Fluid	Dr. P. G. WALKER
6th Feb.	Rheumatoid Arthritis	Dr. R. NASSIM
13th ,,	Dislocations (Traumatic)	Mr. J. N. WILSON
20th ,,	Congenital Dislocation of the Hip	Mr. D. TREVOR
27th ,,	Pathology of Joint Disease	Dr. H. A. SISSONS
6th March	Cartilage in Joint Infection	Dr. C. H. LACK
13th ,,	Arthrodesis and Arthroplasty	Mr. K. I. NISSEN
20th ,,	Internal Derangement of the Knee	Mr. A. T. FRIPP

The fee for the full course will be 3 guineas, or for a single lecture 7*s.* 6*d.*

Tickets may be obtained on application to the Dean, at 234, Great Portland-street.

L.M.S.S.A.

FINAL EXAMINATION: MEDICINE and SURGERY, 12th January, 9th February, 9th March, 1959. MIDWIFERY and PATHOLOGY, 13th January, 10th February, 9th March, 1959. MASTERY OF MIDWIFERY, May and November. DIPLOMA in INDUSTRIAL HEALTH, July and December.

For regulations apply REGISTRAR, Apothecaries Hall, Black Friars-lane, London, E.C.4.

GLASGOW POST-GRADUATE MEDICAL EDUCATION COMMITTEE

COURSE IN PSYCHOLOGICAL MEDICINE

A two-term part-time Course has been organised to run during the Candlemas (5TH JANUARY–14TH MARCH) and Whitsun (13TH APRIL–20TH JUNE) terms, 1959. The Course is designed to supply formal training for graduates who intend to specialise in Psychiatry, but is open to all registered medical practitioners. The instruction will amount to 10 hours per week, given on Monday, Tuesday, and Thursday afternoons and Saturday mornings. During the Candlemas term, instruction will be provided in disciplines basic to Psychiatry. During the Whitsun term, instruction will be on clinical subjects and students will attend various psychiatric hospitals. The fee for the Course is £35.

For further details, application should be made to the Director of Post-Graduate Medical Education, The University, Glasgow, W.2.

THE UNIVERSITY and the ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW
POST-GRADUATE MEDICAL EDUCATION COMMITTEE

COURSE ON THE USE OF ISOTOPES IN MEDICAL AND BIOLOGICAL RESEARCH

A Course of instruction for research workers in Universities and Hospitals will be held in Glasgow from MONDAY, 30TH MARCH, to FRIDAY, 10TH APRIL, 1959.

The object of the Course is to give instruction in the techniques by which radioactive isotopes are used in medical and biological research. Lectures, demonstrations, and laboratory classes will be held in the Glasgow University Veterinary School, the Physics Department of the Western Regional Hospital Board, and the Gardiner Institute of Medicine.

12 places will be available ; applicants must be graduates in medicine or in one of the biological sciences. The fee for the Course is 10 guineas.

Application forms may be obtained from the Director of Post-graduate Medical Education, The University, Glasgow, W.2, to whom they should be returned before 31st January. Candidates selected for the Course will be notified shortly after this date.

POSTGRADUATE MEDICAL SCHOOL (Hammersmith HOSPITAL). Applications are invited for the post of REGISTRAR IN MORBID ANATOMY for 1st March, 1959. Experience in autopsies and surgical pathology essential. Terms of appointment similar to National Health Service.

Applications, with names of 2 referees, to the Dean, Post-graduate Medical School of London, Ducane-road, London, W.12, by 10th January, 1959.

THE MEDICAL WOMEN'S FEDERATION invites applications for THE CHRISTINE MURRELL MEMORIAL FELLOWSHIP AWARD, value £150, to a Woman medical practitioner registered in one of the British Commonwealth of Nations and on the British Medical Register. The Award will be made for research, or undertaking of secretarial expenses of research work, or the purchase of equipment required therefor. The Award will be for 1 year and be renewable for 1 further year.

Form of application may be had on request to the Secretary, The Medical Women's Federation, Tavistock House North, Tavistock-square, London, W.C.1, and should be returned not later than 30th April, 1959. It should be accompanied by a plan of the proposed subject of research to be undertaken. The names of 3 referees should be supplied.

UNIVERSITY OF LONDON. The Senate invite applications for the CHAIR OF MEDICINE tenable at the Royal Free Hospital School of Medicine (salary in the range £2500–£3000 a year).

Applications (10 copies) must be received not later than 19th January, 1959, by the Academic Registrar, University of London, Senate House, W.C.1, from whom further particulars may be obtained.

BRADFORD INSTITUTE OF TECHNOLOGY. (Principal: E. G. EDWARDS, PH.D., B.SC., F.R.I.C.) Applications are invited for the post of SENIOR TECHNICIAN in the Departments of Biological Sciences and Pharmacy to take charge of the animal house. The person appointed will be expected to have had experience in the maintenance of colonies of animals. Salary scale: £625–£20–£745 (with efficiency bar at £685).

Further particulars and forms of application may be obtained from the Registrar, Bradford Institute of Technology, Bradford, 7, to whom they should be returned not later than 7th January, 1959. W. H. LEATHEM, Clerk to the Governors.

UNIVERSITY OF MALAYA. Applications are invited for LECTURESHIP IN SURGERY. Salary scale: £1295–£49–£1442/£1540–£56–£1988 p.a., entry-point according to qualifications and experience. Allowances: expatriation in range £280–£308 p.a., cost of living in range £210–£560 p.a. Passages for appointee, wife, and children under 12 years. Part-furnished quarters at reasonable rent. Provident fund scheme.

Detailed applications (6 copies), naming 3 referees, by 15th January, 1959, to Secretary, Inter-University Council for Higher Education Overseas, 29, Woburn-square, London, W.C.1, from whom further particulars may be obtained.

UNIVERSITY OF OTAGO AND OTAGO HOSPITAL BOARD, DUNEDIN, NEW ZEALAND. Applications are invited for the joint post of FIRST ASSISTANT to the Professor of Surgery and ASSISTANT SURGEON to the Otago Hospital Board, with charge of beds, outpatients and operating sessions. Applicants must hold a degree in medicine from an approved University. The position ranks as Junior or Senior Lecturer in the University of Otago and as Junior or Senior Specialist under the Hospital Employment Regulations and the salary will be within the scales £1640–£1940 or £2040–£2340 p.a. The commencing rate within the scales will be that determined by the Medical Officers' Salaries Grading Committee in accordance with the appointee's qualifications and experience. The post is full-time and involves teaching, clinical and some administrative duties. There are excellent facilities for experimental surgery; and previous research experience will be an advantage. Travelling expenses will be paid in accordance with the table set out in the conditions of appointment, which, together with application forms, may be obtained from the Office of the High Commissioner for New Zealand, 415, Strand, London, W.C.2, or from the undersigned.

Applications, stating age, qualifications and experience, together with health and chest certificates, will be received by the undersigned until 10 o'clock A.M. on Monday, 2nd March, 1959. W. A. WILLIAMSON, Secretary, Otago Hospital Board.

P.O. Box 946, Dunedin, New Zealand.

Hospital Services: Senior Appointments

ST. JAMES' HOSPITAL, Balham, London, S.W.12. Locum CONSULTANT NEUROLOGIST required for 1 half-day per week at present.

Applications, giving full particulars, to the Group Secretary, Wandsworth Hospital Group, at the above address.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

Romford Group of hospitals

Maximum Part-time CONSULTANT RADIOLOGIST. Duties mainly at Oldchurch Hospital, Romford, and may include visits to Warley Hospital, Brentwood.

Jubilee and Claybury Hospitals, Woodford Green

Part-time CONSULTANT E.N.T. SURGEON(S) for 1 session a week (Jubilee) and 1 session a month (Claybury). Candidates may apply for 1 or both sessions.

Queen Elizabeth and Hackney Groups of hospitals

Maximum Part-time CONSULTANT PÆDIATRICIAN. Duties include 3 sessions a week each at Queen Elizabeth Hospital for Children, E.2, Hackney Hospital, E.9, and The Mothers' Hospital (Salvation Army), E.5. Further particulars on application.

Applications (6 copies), stating post(s) concerned, and names of 3 referees, should reach the Secretary, North East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, by Saturday, 10th January, 1959.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

1. ASSISTANT CHILD PSYCHIATRIST (Senior Hospital Medical Officer grade), 6 half-days a week, Hertfordshire Child Guidance Service. Candidates may visit by appointment with the Medical Director, Child Guidance Clinic, Hill End, St. Albans.

Applications before 14th January, 1959.

2. CONSULTANT CLINICAL PATHOLOGIST, whole-time or maximum sessions, Edgware General Hospital, Edgware, Middlesex (647 Beds). Successful candidate will be required to take charge of the Bacteriological Department.

Applications before 12th January, 1959.

3. CONSULTANT TRAUMATIC AND ORTHOPÆDIC SURGEON, whole-time or maximum sessions, Whittington Hospital, London, N.19 (1054 Beds). Duties will include overall supervision of the Casualty Department, together with attendances in the Friern Group of hospitals, New Southgate (approximately 2500 Beds for mental illness).

Applications before 19th January, 1959.

Hospitals may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, North West Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2.

ROYAL MARSDEN HOSPITAL, Fulham-road, London, S.W.3. Applications are invited for the post of Full-time ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer grade) in the Department of Pathology (morbid anatomy).

Applications, together with names of 3 referees, should be sent to the House Governor to reach him by 31st December, 1958.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Lisle-street, Leicester-square, London, W.C.2. Applications are invited for the appointment of CONSULTANT DERMATOLOGIST to the Hospital for 3 sessions a week. Applicants must be Fellows or Members of the Royal College of Physicians of London.

Applications (10 copies), stating age, qualifications and experience, with names of 3 referees, should be addressed to the Secretary to the Board of Governors not later than 24th January, 1959.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens SENIOR HOSPITAL MEDICAL OFFICER in Orthopædic Surgery. Vacant now. Duties at hospitals in the Wolverhampton and Dudley and Stourbridge Groups of hospitals. Experience specialty essential. Salary £34 14s. 6d. per week less emoluments.

Apply immediately to Secretary, 10, Augustus-road, Birmingham, 15, naming 3 referees.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the appointment of CONSULTANT ANÆSTHETIST on the basis of maximum part-time service. The successful candidate may be invited to undertake postgraduate studies in other approved centres either in this country or abroad, for which purpose a Fellowship will be available which will include travelling expenses and subsistence allowance and a basic salary.

Applications, giving the names of 3 referees, must be submitted on a form to be obtained from the Secretary to the Board of Governors, Queen Elizabeth Hospital, Birmingham, 15, and returned by 10th January, 1959.

NEWCASTLE REGIONAL HOSPITAL BOARD. CONSULTANT PSYCHIATRIST, whole-time, for St. Luke's Hospital, Middlesbrough (565 Beds), and associated outpatient clinics and general hospital groups. A large amount of outpatient work is carried out from this Hospital. There is an active Electrocardiographic Department, also a detached Child Guidance Unit with an active outpatient department. Experience in child psychiatry desirable. The areas served by the Hospital include Middlesbrough County Borough and parts of the North Riding of Yorkshire. Candidates should have had wide experience in intra- and extra-mural psychiatry, and be competent to take clinical charge subject to the general administrative control of the Medical Superintendent of a section of the Hospital and to participate in the work of the associated outpatient clinics.

Applications, with names and addresses of 3 referees, to Regional Psychiatrist, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. CONSULTANT PHYSICIAN in Physical Medicine, whole-time or maximum part-time, for North and South Tees-side, Darlington and Northallerton Groups of hospitals. Main centre Middlesbrough General Hospital (305 Beds, plus a new accident wing of 164 Beds to be opened about March, 1959). Population served 619,000. Further particulars from Senior Administrative Medical Officer.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

MANCHESTER REGIONAL HOSPITAL BOARD. Whole-time or maximum Part-time RESIDENT CONSULTANT ORTHOPÆDIC SURGEON AND SURGEON-SUPERINTENDENT to Wrightington Hospital, near Wigan. The Hospital serves the whole of the region for non-pulmonary tuberculosis and is also being developed as a special orthopædic centre for non-tuberculous disease. It has 343 Beds, 100 of which are allocated to adult chest diseases. Thoracic surgery is undertaken. A modern detached house is available. Higher qualifications essential.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 22nd December, 1958.

AMENDED ADVERTISEMENT

OXFORD REGIONAL HOSPITAL BOARD/UNITED OXFORD HOSPITALS. PHYSICIAN-SUPERINTENDENT at Littlemore Hospital, Oxford, and CONSULTANT PSYCHIATRIST to both Boards. The appointment (whole-time or maximum part-time) will be mainly to the Oxford/Banbury Area Department of Psychological Medicine, but includes work as Consultant Psychiatrist to the United Oxford Hospitals, and membership of the staff of the Teaching Hospital. In addition to the D.P.M. applicants should hold a higher medical qualification. The successful candidate will be required to live within the curtilage of Littlemore Hospital.

Applications, stating age, experience and qualifications, and giving the names of 3 referees, should reach the Secretary, 43, Banbury-road, Oxford, by 12th January, 1959.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments :—

Whole-time CONSULTANT CLINICAL PATHOLOGIST with duties mainly at the Vale of Leven Hospital, Alexandria, Dunbartonshire.

ASSISTANT ANÆSTHETIST at the Royal Samaritan Hospital for Women, Glasgow. The appointment will be part-time on the basis of 4 notional half-days per week. Salary (at age 32 and over) on the scale £1653 15s.–£52 10s.–£2126 5s.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SHEFFIELD REGIONAL HOSPITAL BOARD. CONSULTANT ORTHOPÆDIC SURGEON (maximum part-time) required for Lincoln Area with main duties at Lincoln County and St. George's Hospitals.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 10th January, 1958.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Part-time CONSULTANT GENERAL SURGEON for 4 notional half-days a week in the Bromley Group of hospitals. The duties are mainly at Bromley Hospital and comprise operating sessions on Wednesday and Friday mornings, an outpatient clinic on Wednesday afternoon, ward rounds and emergencies. Candidates must have had a wide experience in general surgery and be Fellows of a Royal College of Surgeons. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales). Candidates may visit the Hospital concerned.

Applications, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war or national service, together with the names and addresses of 3 referees, to be sent to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, London, W.2, by not later than 3rd January, 1959.

WELSH REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PSYCHIATRIST/MEDICAL SUPERINTENDENT, Ely Hospital, Cardiff (400 mental deficiency beds and 215 Beds for elderly mental patients.)

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

CHANNEL ISLANDS. JERSEY GENERAL HOSPITAL. (200 Beds.) Applications are invited for the post of VISITING E.N.T. SURGEON from practitioners holding F.R.C.S. or D.L.O. The post falls vacant on the 1st January, 1959, and the salary is at the rate of £800 p.a. for 4 sessions weekly. The successful applicant will be required to be resident in the Island and a private practice is permitted.

Applications to be submitted not later than 3rd January, 1959, to the President, Public Health Committee, General Hospital, Jersey, C.I.

NEW ZEALAND. THE SOUTH CANTERBURY HOSPITAL BOARD, TIMARU, NEW ZEALAND. Applications are invited for the post of E.N.T. SURGEON, which is a part-time appointment for an initial period of 3 years and renewable. Salary is governed by the Hospital Employment Regulations, and would be, according to qualifications and experience, up to £775 for work at Timaru Hospital. In addition there is a fortnightly clinic conducted at Oamaru, 55 miles distant, for which a fee of £10 10s. plus travelling time and mileage allowance is payable. The total salary will be approximately £1200 (N.Z. currency) p.a. for a senior man. The appointee would establish himself in private practice without financial obligation. First-class private hospital facilities are available in the town. Further particulars obtainable from the Medical Superintendent, Public Hospital, Timaru.

Applications, stating age, qualifications and experience, and enclosing not more than 3 copies only of recent testimonials, close on 14th January, 1959, with the Secretary, The South Canterbury Hospital Board, P.O. Box 88, Timaru, New Zealand.

Hospital Services: Junior Appointments

BETHLEM ROYAL HOSPITAL AND THE MAUDSLEY HOSPITAL. Applications are invited from registered medical practitioners for the appointment of REGISTRAR for the period from 1st April, 1959, to 7th April, 1960, at the above Postgraduate Teaching Hospital, with which is associated the Institute of Psychiatry (University of London). Candidates with experience in general medicine and neurology or in psychology will receive special consideration.

Applications, giving details of experience and the names of 2 referees, should be made within 2 weeks of the appearance of this advertisement. Application forms obtainable from K. J. JOHNSON, House Governor and Secretary, Maudsley Hospital, Denmark Hill, London, S.E.5.

BETHLEM ROYAL HOSPITAL AND THE MAUDSLEY HOSPITAL. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER for the period from 1st April, 1959, to 7th April, 1960, at the above Postgraduate Teaching Hospital, with which is associated the Institute of Psychiatry (University of London). Experience in general medicine and neurology or in the basic sciences is an advantage.

Applications, giving details of experience and the names of 2 referees, should be made within 2 weeks of the appearance of this advertisement. Application forms obtainable from K. J. JOHNSON, House Governor and Secretary, Maudsley Hospital, Denmark Hill, S.E.5.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. ROYAL FREE HOSPITAL GROUP. Applications are invited from pre-registration and registered Women medical practitioners for the post of HOUSE SURGEON to Gynæcological Department (recognised for M.R.C.O.G.). Duties to commence 1st February, 1959. Appointment for 6 months. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 18th December, 1958.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. ROYAL FREE HOSPITAL GROUP. Applications are invited from pre-registration and registered Women medical practitioners for the post of FIRST HOUSE SURGEON, with charge of general surgical beds. Appointment for 6 months from 1st February, 1959. Salary according to Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 18th December, 1958.

HACKNEY GROUP HOSPITAL MANAGEMENT COMMITTEE, London, E.9. Applications are invited for the 12-month resident appointment, vacant 13th January, of SENIOR HOUSE OFFICER (anæsthetics). Duties shared between German Hospital (157 Beds—general) and the Mothers' Hospital (Salvation Army) (110 Beds—maternity), with residence at the German Hospital. The post offers experience in general surgical anæsthesia, and is approved for the Diploma in Anæsthetics. Facilities for study provided.

Apply Group Secretary, Hackney Hospital, E.9, by 3rd January.

HACKNEY HOSPITAL, London, E.9. (General—850 Beds.) Applications are invited for the 6-month resident posts, vacant 1st and 4th February, of HOUSE SURGEONS to Obstetric and Gynæcology Departments (2 vacancies—1 for pre-registration candidate, recognised for D.Obst.R.C.O.G.).

Apply Secretary, above address, by 19th December, quoting HH/OG.

HACKNEY HOSPITAL, London, E.9. (General—850 Beds.) Applications for 2 6-month resident posts, vacant 10th and 18th January, of Pre-registration HOUSE PHYSICIAN should reach Secretary, above address, by 15th December, quoting HH/PHP.

HACKNEY HOSPITAL, London, E.9. (General—850 Beds.) Applications for 2 6-month resident posts, vacant 16th January and 1st February, of Pre-registration HOUSE SURGEON (recognised for F.R.C.S.) should reach Secretary, above address, by 19th December, quoting HH/PHS.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, N.21. HOUSE PHYSICIAN. Preference given to applicants seeking pre-registration post under Medical Act, 1950.

Applications, with copies of 3 testimonials and name and address of 1 referee, to Hospital Secretary.

KING EDWARD MEMORIAL HOSPITAL, Ealing. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (Resident Surgical Officer) required from 1st February, 1959. Experience in general surgery essential and holding of F.R.C.S. an advantage. Post recognised for F.R.C.S. examination.

Application forms obtainable from and returnable to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 30th December, 1958.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of REGISTRAR to the Radiodiagnostic Department becoming vacant on 1st February, 1959. A higher qualification, although desirable, is not essential.

Applications (10 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 23rd December, 1958. H. BRIERLEY, House Governor.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of Part-time SENIOR REGISTRAR to the Ophthalmic Department becoming vacant on 1st January, 1959. Candidates must be Fellows of the Royal College of Surgeons. The successful candidate will be required to attend on 3 half-days weekly.

Applications (10 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 29th December, 1958. H. BRIERLEY, House Governor.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. 2 vacancies (1 resident, 1 non-resident) occur 1st February, 1959, for HOUSE PHYSICIAN. Appointment for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and post graded as House Officer. Duties include work in the Outpatient Department and Special Clinics as well as in wards. The resident post will be attached to the Cardiological firm during the 4 months in London.

Applications, stating date of birth, qualifications, with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 19th December, 1958.

J. ROBBINS, House Governor.

London Chest Hospital, E.2.

LONDON CHEST HOSPITAL, E.2. Hospitals for Diseases OF THE CHEST. Applications are invited for the post of REGISTRAR IN ANÆSTHETICS (recognised for F.F.A. R.C.S.). The post is a whole-time one, non-resident and tenable in the first instance for 1 year. Duties include attendance at the Country Branch, near Letchworth, Hertfordshire.

Applications, stating date of birth, qualifications with dates, previous appointments held, and accompanied by copies of 3 testimonials, should reach the undersigned by 19th December, 1958. J. ROBBINS, House Governor.

London Chest Hospital, E.2.

MARLBOROUGH DAY HOSPITAL. 38, Marlborough-place, N.W.8. PSYCHIATRIC REGISTRAR required for 3 sessions per week. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 22nd December, 1958.

METROPOLITAN HOSPITAL, Kingsland-road, London, E.8. (General—146 Beds.) Applications are invited for the pre-registration posts of 2 HOUSE PHYSICIANS, vacant 1st January, 1959.

Applications from provisional and fully registered candidates, stating age, nationality, qualifications and experience, with copies of 3 recent testimonials, to the Hospital Secretary by 17th December, 1958.

METROPOLITAN HOSPITAL, Kingsland-road, London, E.8. (General—146 Beds.) Applications are invited for the pre-registration posts of 3 HOUSE SURGEONS, vacant 1st January, 1959.

Applications from provisional and fully registered candidates, stating age, nationality, qualifications and experience, with copies of 3 recent testimonials, to the Hospital Secretary by 17th December, 1958.

MOORFIELDS EYE HOSPITAL (City Road Branch), London, E.C.1. Applications are invited for the post of SIXTH HOUSE SURGEON (Registrar) (non-resident). The appointment is for a period of 4 months from 1st March, 1959, and the holder of the post at the completion of that time will be eligible for appointment as Fifth, Fourth, Third, Second Resident Surgical Officer, and subsequently as Senior Resident Officer, for similar periods.

Applications should be submitted on the official form obtainable from the undersigned, stating age and qualifications, together with testimonials and photograph, and be received not later than 22nd December, 1958.

J. P. HEMING, House Governor.

MOTHERS' HOSPITAL (Salvation Army), London, E.5. (Maternity, 110 Beds.) Applications from registered practitioners for 2 6-month resident appointments, vacant 1st February and 1st April respectively, of OBSTETRIC HOUSE SURGEON (recognised for M.R.C.O.G.) should be sent to Group Secretary, Hackney Hospital, E.9, quoting MH/HO.

MOTHERS' HOSPITAL (Salvation Army), London, E.5. (Maternity, 110 Beds.) Applications for the 6-month resident appointment, vacant 1st March, of Pre-registration OBSTETRIC HOUSE SURGEON (recognised for M.R.C.O.G.) should be sent to Group Secretary, Hackney Hospital, E.9, quoting MH/PHO. Registered practitioners may apply.

NORTH MIDDLESEX HOSPITAL, London, N.18. Locum REGISTRAR in Medicine (general) required for indefinite period, starting about 1st January. Higher qualification in medicine desirable. Non-resident, but required to sleep in Hospital on full duty nights (7 in 21).

Applications, with full particulars, and copies of testimonials or names of referees, to Secretary of Hospital.

NORTH MIDDLESEX HOSPITAL, London, N.18. Applications are invited from pre- and post-registration candidates for the post of RESIDENT OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON. 6 months' appointment from 1st February, 1959. Post recognised by Royal College of Obstetricians and Gynæcologists for Diploma, and as a combined post for Membership. Candidates must have held house appointment in either medicine or surgery. Large Obstetric and Gynæcological Department.

Applications (in own handwriting), giving full particulars, together with copies of recent testimonials, to Secretary of Hospital, by 18th December, 1958.

NORTH MIDDLESEX HOSPITAL AND EDMONTON CHEST CLINIC, London, N.18. Applications are invited for the post of SENIOR HOUSE OFFICER, resident, for beginning of February, 1959. Duties, at above Hospital and Chest Clinic under the direction of the Chest Physician, include care of tuberculous and non-tuberculous chest cases. Further details on request. Appointment for 6 months in the first instance with possible extension to 1 year.

Applications, giving full particulars of qualifications, experience, &c., with copies of recent testimonials and/or names of 2 referees, should reach the Hospital Secretary not later than 31st December.

NELSON HOSPITAL, Kingston-road, Merton, S.W.20. (123 Beds.) HOUSE SURGEON (resident, approved for pre-registration service). Post vacant now.

Applications, stating age, qualifications, &c., and the names and addresses of 2 referees, to the Secretary at above address.

NELSON HOSPITAL, Kingston-road, Merton, S.W.20. (123 Beds.) RESIDENT ANÆSTHETIST (Senior House Officer grade) with certain duties as House Physician in the Children's Ward and Casualty Department. Post recognised for D.A. Vacant 1st January, 1959.

Applications, stating age, qualifications and experience, with copies of testimonials and the name of 1 referee, should be sent to the Group Secretary, St. Heller Hospital, Carshalton, Surrey.

NELSON HOSPITAL, Kingston-road, Merton, S.W.20. HOUSE SURGEON (resident, not pre-registration). Post vacant mid-January. Recognised for F.R.C.S.

Applications, stating age, qualifications, &c., and the names and addresses of 2 referees, to the Secretary at above address.

NEASDEN HOSPITAL (Acute Infectious Diseases), Brentfield-road, London, N.W.10. SENIOR HOUSE OFFICER (resident) required, 1st January, 1959, or by arrangement. Hospital offers wide clinical experience of acute medicine and is a Regional Poliomyelitis Centre. Excellent opportunities for post-graduate studies.

Applications to the Physician-Superintendent.

NEW END HOSPITAL, Hampstead, N.W.3. Department of Endocrinology. Applications are invited for the position of HOUSE PHYSICIAN (pre-registration) vacant 18th January, 1959.

Application forms obtainable from Group Secretary, 46, Cholmeley Park, N.6, and returnable to Surgeon-Superintendent, New End Hospital, by 22nd December, 1958.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN, Hackney-road, E.2; Shadwell, E.1; BANSTEAD, SURREY. SENIOR RESIDENT MEDICAL OFFICER (Male or Female), graded Senior House Officer, at Hackney-road, E.2. Senior of 8 House Officers in a hospital engaged in postgraduate and undergraduate teaching. Previous paediatric experience essential. Appointment will be for 1 year from 1st March, 1959.

Application forms (obtainable from the Secretary at Hackney-road) should be returned with copies of 3 testimonials, not later than 3rd January, 1959.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. HOUSE PHYSICIAN (third post) required for 2 general medical inpatient wards at Plaistow Hospital. Inpatient work only at present. 6-month appointment, commencing 1st February, 1959. Suitable for postgraduate study for higher diploma in medicine.

Apply to Hospital Secretary, giving names of 3 referees, by 27th December, 1958.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. HOUSE SURGEON (pre-registration) required for 6 months commencing as soon as possible. Post recognised for F.R.C.S.

Applications, with copies of recent testimonials, to Hospital Secretary by 27th December, 1958.

QUEEN MARY'S (ROEHAMPTON) HOSPITAL, London, S.W.15. SENIOR HOUSE OFFICER (orthopaedic) required. National Health Service terms and conditions.

Apply Medical Superintendent.

ROYAL FREE HOSPITAL GROUP. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Registrar grade) to work at the Lawn Road Branch of the Royal Free Hospital. Terms and conditions of service in accordance with Registrar grade. Duties, which are for 1 year in the first instance, to commence on 1st January, 1959.

Application forms may be obtained from the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 20th December, 1958.

ROYAL FREE HOSPITAL GROUP. Applications are invited from either Men or Women medical practitioners for the appointment of ANÆSTHETIC REGISTRAR (resident). The appointment is for 1 year in the first instance, duties to begin on 1st January, 1959.

Application forms may be obtained from the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 20th December, 1958.

ROYAL FREE HOSPITAL. Applications are invited for the post of SENIOR REGISTRAR to the Diagnostic X-ray Department at the Royal Free Hospital. The post is non-resident for 1 year in the first instance, duties to commence as soon as possible. Candidates are required to hold the D.M.R.(D.).

Formal applications, giving details of experience, &c., together with the names of 3 referees, should be sent to the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 29th December, 1958.

ROYAL MARSDEN HOSPITAL, Fulham-road, S.W.3. Applications are invited for the post of SURGICAL SENIOR REGISTRAR. Appointment will be for 5 sessions a week from 1st January, 1959. Candidates must hold F.R.C.S. diploma.

Applications on a form obtainable from the House Governor to be submitted by 29th December, 1958.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Female medical practitioners for the appointment of GYNÆCOLOGICAL HOUSE SURGEON. Vacant 23rd February, 1959. Recognised for the M.R.C.O.G.

Application forms from the Secretary.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Pathology (full-time). Applications are invited from Women medical practitioners who should have had experience of laboratory work. Canvassing will disqualify, but candidates are not precluded from visiting the Hospital if they so desire.

Forms of application from the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to whom completed applications should be returned not later than 27th December, 1958.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Obstetrics and Gynæcology. Duties at Nelson Hospital, Merton, S.W.20 (6 sessions), and St. Teresa's Maternity Hospital, Wimbledon (5 sessions).

Application forms, obtainable from the Group Secretary, St. Heller Hospital, Carshalton, Surrey, to be returned not later than 27th December.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. (575 Beds.) Required for duty 9th January, 1959, HOUSE PHYSICIAN, pre-registration, for general duties.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to reach the Hospital Secretary by 20th December, 1958.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. (575 Beds.) Required for duty on 1st January, 1959, HOUSE PHYSICIAN, pre-registration, for general duties.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to reach the Hospital Secretary within 10 days of the appearance of this advertisement.

ST. CLEMENT'S HOSPITAL, Bow, E.3. House Physician (not pre-registration) for general medical wards. Post vacant January, 1959.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be sent to Hospital Secretary immediately.

ST. FRANCIS HOSPITAL, Constance-road, East Dulwich, S.E.22. SENIOR HOUSE OFFICER required in the Group Geriatric Unit under direction of full-time Geriatrician. The unit is associated with a half-way house; there are follow-up and pre-admission outpatient clinics and facilities for investigations. Resident post.

Apply giving age, qualifications and experience, with copy testimonials or names of 2 referees, to Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, East Dulwich-grove, S.E.22, not later than 30th December.

ST. MARY'S HOSPITAL FOR WOMEN AND CHIL-DREN, Upper-road, Plaistow, London, E.13. HOUSE SURGEON (pre-registration, first, or second post) to commence 27th January, 1959. Duties include general surgery, gynæcology, and E.N.T.

Apply to Hospital Secretary, immediately.

ST. MARY'S HOSPITAL, Paddington, W.2. Registrar (whole-time, Male) in the Venereal Diseases Department for first period of 12 months from date to be arranged. Suitable for person reading for higher qualification.

Applications, with name and addresses of 3 referees, must reach the House Governor within 10 days of appearance of this notice.

ST. NICHOLAS HOSPITAL, Plumstead, S.E.18. House SURGEONS. Vacant 1st January. Recognised for F.R.C.S. and approved for pre-registration service.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. OLAVE'S HOSPITAL, Lower-road, Rotherhithe, S.E.16. BERMONDSEY AND SOUTHWARK GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER, Casualty Department, at above Hospital, which becomes vacant on 1st January, 1959. Salary £819 10s. p.a. Post recognised for F.R.C.S., is tenable for 6 months and is renewable.

Applications, together with full details, and names of 2 referees, to the Secretary at above address, within 1 week of advertisement.

ST. THOMAS'S HOSPITAL and THE SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD (joint appointment). Whole-time SENIOR REGISTRAR or REGISTRAR, to Children's Department, for 1 year in the first instance. 8 sessions per week at St. Thomas's Hospital and 3 sessions per week at the Lambeth Hospital.

Applications (5 copies), naming 3 referees, to Clerk of the Governors, St. Thomas's Hospital, S.E.1, by 7th January, 1959.

ST. THOMAS'S HOSPITAL, London, S.E.1. Medical OFFICER (part-time Medical Officer status), to Department of Venereal Diseases, from 1st March, 1959, to carry out 8 half-day sessions per week. £1470 p.a. In the event of an inadequate response from suitably qualified applicants the appointment of a Junior Hospital Medical Officer will be made.

Applications, naming 2 referees, to Clerk of the Governors by 29th December, 1958.

ST. THOMAS'S HOSPITAL, London, S.E.1. Junior HOSPITAL MEDICAL OFFICER to Department of Venereal Diseases, for 1 year in the first instance, to carry out 8 half-day sessions per week.

Applications, naming 2 referees, to Clerk of the Governors, by 29th December, 1958.

ST. THOMAS'S HOSPITAL, London, S.E.1. Senior REGISTRAR to the X-Ray Diagnostic Department. Whole-time, for 1 year in the first instance.

Applications, naming 2 referees, to Clerk of the Governors by 20th December, 1958.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 18th March, 1959, for a Full-time ORTHODONTIC REGISTRAR.

Further particulars and application form, to be returned by 5th January, 1959, obtainable from the House Governor.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 1st April, 1959, for a MEDICAL REGISTRAR AND PATHOLOGIST (Senior Registrar grade).

Further particulars and application form, to be returned by 5th January, 1959, obtainable from the House Governor.

WEST LONDON HOSPITAL, Hammersmith-road, W.6. RESIDENT CASUALTY OFFICER (Senior House Officer grading) required immediately.

Detailed applications, copies 2 recent testimonials, to Secretary immediately.

WHITTINGTON HOSPITAL, London, N.19. (1054 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Anæsthetics. Regional training scheme includes facilities for gaining experience in specialist techniques at Regional Centres for Plastic and Thoracic Surgery. Possession of higher qualification in anæsthetics desirable. Hospital (recognised for F.F.A. R.C.S.) may be visited by direct appointment.

Application forms obtainable from and returnable to the Group Secretary, 46, Cholmeley Park, N.6, by 22nd December, 1958.

ABERYSTWYTH, CARDIGANSHIRE. GENERAL HOSPITAL. MID-WALES HOSPITAL MANAGEMENT COMMITTEE. Pre-registration HOUSE SURGEON and HOUSE PHYSICIAN required at the above Hospital. Both vacancies occur on 1st January, 1959. Surgical post recognised for F.R.C.S.

Applications, quoting 2 referees, to Group Secretary, 31, North Parade, Aberystwyth, Cardiganshire, immediately.

ALTON GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Surgery (Registrar grade) required for the Alton General Hospital (136 Beds) with duties at the Henry Gauvain Hospital (112 beds), Alton. Vacant mid-February, 1959. The post is resident (single accommodation) or non-resident.

Forms of application, obtainable from the Group Secretary, Lord Mayor Treloar Orthopædic Hospital, Alton, Hants, must be completed and returned as soon as possible.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, 3 HOUSE SURGEONS, mid-January, 1959. 6 months' appointments, suitable for pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN required at Ashton-under-Lyne General Hospital. Vacant mid-February, 1959. Preference given to pre-registration candidates.

Applications, with copies of 2 testimonials, to Group Secretary, General Hospital, Ashton-under-Lyne.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE.

SENIOR HOUSE OFFICER (obstetrics/gynæcology) required at Ashton-under-Lyne General Hospital. Bed complement 75 obstetrics and 26 gynæcology. Recognised for M.R.C.O.G. Vacant February, 1959.

HOUSE OFFICER (midwifery) required. Post recognised for D.Obst.R.C.O.G., vacant February, 1959. Preference given to pre-registration candidates.

Applications, with copies of 2 testimonials, to Group Secretary, General Hospital, Ashton-under-Lyne, Lancs.

AYLESBURY, BUCKINGHAMSHIRE. ROYAL BUCKINGHAMSHIRE HOSPITAL. HOUSE OFFICER (accident and orthopædic and children's general surgery) required 1st February, 1959. Pre-registration post but registered practitioners invited to apply.

Apply, with 2 names for reference, to Secretary-Superintendent.

BANBURY, OXFORDSHIRE. HORTON GENERAL HOSPITAL. (162 Beds.) Locum CASUALTY OFFICER required, 23rd–31st December. Salary according to experience up to Junior Hospital Medical Officer grade.

Applications to the Secretary.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE PHYSICIAN (pre-registration) required immediately.

Applications, naming 2 referees, to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BEDFORD GENERAL HOSPITAL. (424 Beds.) House SURGEON required. Pre- or post-registration, recognised for F.R.C.S. Post offers exceptional opportunities for general experience in busy acute surgical units. Holder of this appointment will be favourably considered for appointment as House Physician at the termination of contract.

Applications, with copies of 2 recent testimonials, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 acute beds.)

(*a*) ASSISTANT PATHOLOGIST (Senior House Officer grade) required for the Area Laboratory. Offers experience all branches of pathology. Vacant now.

(*b*) HOUSE SURGEON (Senior House Officer or House Officer grading according to experience). Recognised for F.R.C.S. General surgery.

(*c*) HOUSE PHYSICIANS (2). Senior House Officer or House Officer grading according to experience.

(*d*) ORTHOPÆDIC HOUSE SURGEON (Senior House Officer or House Officer grading according to experience). Recognised for F.R.C.S.

(*e*) HOUSE SURGEON (Senior House Officer or House Officer grading according to experience). Part general surgery ; part orthopædics.

Posts (*b*), 1 of (*c*), and (*d*) are approved pre-registration posts, but fully registered practitioners may apply. All except (*a*) are vacant end January. Married accommodation may be available.

Detailed applications to Group Secretary.

BIRMINGHAM. UNITED BIRMINGHAM HOSPITALS. THE BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN, Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. 2 RESIDENT GYNÆCOLOGICAL HOUSE SURGEONS—pre-registration or otherwise—required for duty 7th January, 1959. Recognised for M.R.C.O.G.

Application forms obtainable from House Governor at above address, to be returned immediately.

G. A. PHALP, Secretary.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade), vacant in February, 1959. The post is suitable for persons training for pædiatrics or contemplating a career in pathology. The holder is expected to attend clinical rounds and meetings and to assist in the investigation of clinical problems.

Forms of application, obtainable from the House Governor, should be returned to him by 31st December, 1958.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE BIRMINGHAM AND MIDLAND HOSPITALS FOR WOMEN (incorporating the Hospital for Women and the Birmingham Maternity Hospital), Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. Applications are invited for the appointment of OBSTETRICAL AND GYNÆCOLOGICAL REGISTRAR (Senior Registrar grade). The appointment will be for 1 year in the first instance and subject to annual review. The successful candidate may subsequently be required to spend not more than 2 years in a selected hospital of the Birmingham Regional Hospital Board in accordance with an arrangement for interchange of Registrars agreed between the two Boards. A higher qualification is essential.

Forms of application may be obtained from, and should be returned immediately to, the House Governor at the above address. G. A. PHALP, Secretary.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. (215 Beds and 8 House Surgeons.) HOUSE SURGEONS (resident), posts now vacant. Hospital treats over 50,000 injured patients each year, and is recognised for purpose of casualty training by R.C.S. (Eng.). 6-month appointment, part of which may be spent in 42-bedded segregated Burns Unit.

Apply, naming 2 referees, to Administrator.

BIRMINGHAM. HEATHFIELD ROAD MATERNITY HOSPITAL, 134, Heathfield-road, BIRMINGHAM, 19. OBSTETRIC HOUSE SURGEON required 1st February, 1959. Previous medical and surgical experience preferred. 50-Bed maternity unit with 18-Cot Premature Baby Unit attached. Large Antenatal Department. Appointment recognised for D.Obst.R.C.O.G.

Detailed applications, with copies of 3 recent testimonials, to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. LORDSWOOD MATERNITY HOSPITAL, HARBORNE, BIRMINGHAM, 17. OBSTETRIC HOUSE OFFICER (resident). Post vacant 1st February. 33 Beds dealing with normal and abnormal midwifery. Recognised for D.Obst.R.C.O.G. Second period training school for pupil midwives.

Applications to the Obstetrician not later than 31st December, 1958.

BIRMINGHAM (near). SOLIHULL HOSPITAL, Lode-lane, SOLIHULL. HOUSE PHYSICIAN. Pre-registration post, vacant beginning of January. General hospital offering good experience. 5 other resident medical staff.

Applications, with names of 2 referees, to Medical Superintendent as soon as possible.

BIRMINGHAM (near). SOLIHULL HOSPITAL, Lode-lane, SOLIHULL. HOUSE SURGEON. Pre-registration post. General hospital offering good experience. 5 other resident medical staff. Post vacant beginning of January.

Applications, with names of 2 referees, to Medical Superintendent as soon as possible.

BIRMINGHAM, 13. SORRENTO MATERNITY HOSPITAL, Wake Green-road. (106 Beds, including 31 premature baby cots.) OBSTETRIC HOUSE SURGEON. Recognised for D.Obst.R.C.O.G. Hospital affiliated to Birmingham Medical School for training of students. Vacant 1st February, 1959.

Apply Obstetrician by 31st December, 1958.

BISHOP AUCKLAND, Co. DURHAM. THE GENERAL HOSPITAL. (350 Beds.) HOUSE PHYSICIAN required. Fully registered or provisionally registered practitioner.

Apply, naming 2 referees, to K. G. T., LUXFORD, Group Secretary, South West Durham Hospital Management Committee, at the above address.

BLACKBURN. ROYAL INFIRMARY AND QUEEN'S PARK HOSPITAL. MANCHESTER REGIONAL HOSPITAL BOARD. REGISTRAR, Department of Psychological Medicine. Opportunity for wide experience in the treatment of inpatients and outpatients in general hospitals (including psychiatric inpatients in general medical wards) under direction of Consultant Psychiatrist. Modern, self-contained flat available suitable for married man. Recognised for D.P.M. by Conjoint Board and Manchester University. Facilities for attending D.P.M. course, Manchester University, and studying for higher qualifications. Services of social worker and mental health workers.

Application forms from Group Secretary, Royal Infirmary, Blackburn.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

Queen's Park Hospital, Blackburn

(1) HOUSE OFFICER (obstetrics and gynæcology) required for busy unit of 58 Beds taking normal and abnormal cases. Post vacant 23rd January, 1959. Recognised for membership and Diploma R.C.O.G. (obstetrics).

(2) HOUSE SURGEON required 23rd February, 1959. Post recognised for F.R.C.S. and approved for pre-registration purposes.

(3) HOUSE PHYSICIAN required 14th February, 1959. Post recognised for pre-registration purposes.

Royal Infirmary, Blackburn

(1) HOUSE SURGEONS (2) required 16th and 23rd February, 1959. Posts recognised for F.R.C.S. and approved for pre-registration purposes.

(2) HOUSE PHYSICIAN required 24th January, 1959. Post recognised for pre-registration purposes.

Apply to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Fully registered HOUSE OFFICER (pædiatrics) required 14th January, 1959. Post recognised for D.C.H. Duties as laid down by Consultant Pædiatrician.

Applications, stating experience and giving names of 2 referees, to the Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BOURNEMOUTH (near). CHRISTCHURCH HOSPITAL, CHRISTCHURCH, HAMPSHIRE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (surgery). The post becomes vacant on 18th January, 1959.

Applications to the Hospital Secretary.

BOURNEMOUTH (near). CHRISTCHURCH HOSPITAL, CHRISTCHURCH, HAMPSHIRE. (334 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON (pre-registration intern). The post is now vacant.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of 2 HOUSE SURGEONS (general surgery). The appointments, which become vacant mid-December, are recognised for the F.R.C.S. examination and for pre-registration purposes.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (general surgery) for a period of 6 months, to commence 21st December, 1958. The appointment is a resident one and recognised for the F.R.C.S. examination.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of 2 HOUSE PHYSICIANS. The appointments, which become vacant on 31st January and 6th February, 1959, respectively, are recognised for pre-registration purposes.

Applications to the Hospital Secretary.

BRADFORD A AND B HOSPITAL MANAGEMENT COMMITTEES. JUNIOR HOUSE OFFICER required for Geriatric Admission Unit. Post vacant now. Major portion of duties carried out at St. Luke's Hospital, Bradford.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to the Secretary, Royal Infirmary, Bradford, Yorks.

BRADFORD ROYAL INFIRMARY, Bradford, Yorkshire. (507 Beds.) SENIOR HOUSE SURGEON (Thoracic Unit) required. Vacant 1st February, 1959.

Applications, stating age, experience, nationality, qualifications, with copy testimonials, to the Secretary.

BRADFORD, YORKSHIRE. ROYAL EYE AND EAR HOSPITAL. (105 Beds.) SENIOR HOUSE OFFICER required for E.N.T. Department of 56 Beds. Recognised for D.L.O. and F.R.C.S. Post vacant 3rd January, 1959.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to the Secretary, Royal Infirmary, Bradford.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.) SENIOR CASUALTY OFFICER (Junior Hospital Medical Officer grade) required for busy Casualty Department (2 junior medical staff). Recognised for F.R.C.S.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.) CASUALTY HOUSE SURGEON required end December. Full and varied experience in busy Casualty Department (staff of 3), and also duties in Orthopædic and Traumatic Unit, including charge of beds. Recognised for pre-registration and F.R.C.S.

Applications, stating age, qualifications, experience, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. SUSSEX EYE HOSPITAL. Brighton and LEWES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Locum REGISTRAR in Ophthalmology at the above Hospital. The post is vacant from 26th January to 28th February, 1959.

Applications, with details of previous experience, qualifications, and names of 2 referees, to be sent as soon as possible to Group Secretary, Brighton and Lewes Hospital Management Committee, Royal Sussex County Hospital, Brighton, 7 (Brighton 29155).

BRISTOL. COSSHAM AND FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. SENIOR HOUSE OFFICER, Regional Department of Neurosurgery. Vacant immediately, tenable for 6–12 months. The post offers useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis. Recognised for F.R.C.S.

Applications to Group Secretary, Frenchay Hospital, quoting "N.S.F." Names of 2 referees required.

BRISTOL. SOUTHMEAD GENERAL HOSPITAL GROUP MANAGEMENT COMMITTEE. Required at Southmead Hospital (570 Beds, including 138 maternity) RESIDENT SENIOR HOUSE OFFICER (anæsthetics) for 12 months commencing 18th December, 1958. Recognised for D.A. and F.F.A. R.C.S.

Applications to be made to the Group Secretary, Southmead Hospital, Bristol.

BURTON-ON-TRENT. THE GENERAL HOSPITAL. HOUSE OFFICER (orthopædics) (pre-registration post) required at the above Hospital. Recognised for F.R.C.S.

Applications to Group Secretary as soon as possible.

BURTON-ON-TRENT GENERAL HOSPITAL. (251 Beds.) HOUSE SURGEONS (general), pre-registration. Busy general base hospital for area. 8 residents. Full Consultant service. Excellent experience. Recognised for F.R.C.S. Married accommodation will be available for a joint post.

Applications to Group Secretary, General Hospital, Burton-on-Trent, Staffordshire.

BRENTWOOD. REGIONAL BLOOD TRANSFUSION CENTRE, Crescent-drive, BRENTWOOD, ESSEX. JUNIOR HOSPITAL MEDICAL OFFICER, full-time, required to take charge of mobile blood collecting team, operating in Essex, Herts, and East London. Opportunity is given to study blood transfusion serology in laboratories. Salary £852 10s.–£55–£1182 10s.

Applications, with names of 2 referees and details of previous experience, to Director.

BURNLEY AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE, BURNLEY GENERAL HOSPITAL (650 Beds), REEDYFORD MEMORIAL HOSPITAL, NELSON (95 Beds). RESIDENT HOUSE OFFICERS (surgical). The appointments are approved as pre-registration posts and recognised for F.R.C.S. Subject to satisfactory service, the successful applicants will be favourably considered for appointment as House Physicians at the termination of contract as Surgical House Officer.

Applications, with 2 references, to Group Secretary, Burnley General Hospital.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. ROSSENDALE GENERAL HOSPITAL. MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in General Surgery at the above Hospital. This is a new post, and is at present vacant.

Apply, stating full details, together with the names of 2 referees, to H. WILKINSON, Esq., Group Secretary, Bury General Hospital, Bury, Lancs.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. BURY GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in Pathology (1 of 2 such posts) for the above Group of Hospitals. The successful applicant will be based at Bury General Hospital.

Apply, stating full details, together with the names of 2 referees, to H. WILKINSON, Esq., Group Secretary, Bury General Hospital, Bury, Lancs.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the 2 vacant posts of HOUSE PHYSICIAN (pre-registration), in the above Group.

Apply, stating full details and names of 2 referees, to H. WILKINSON, Group Secretary, Bury General Hospital, Bury, Lancs.

BUSHEY MATERNITY HOSPITAL, Bushey Heath, HERTFORDSHIRE. RESIDENT OBSTETRIC HOUSE SURGEON required for above Hospital. 6 months' appointment. Duties include antenatal and other clinics at the Edgware General Hospital, Edgware, Middlesex. Post vacant 6th January, 1959. Recognised for D.Obst.R.C.O.G. purposes.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Administrator of Edgware General Hospital by 20th December, 1958.

CAERPHILLY DISTRICT HOSPITAL. (Acute General Hospital—226 Beds. 6 miles from Cardiff.) RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE SURGEONS. 1st February. 1 with duties in Orthopædic Department; both recognised for F.R.C.S.

Applications to the Secretary.

CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS. ADDENBROOKE'S HOSPITAL, CAMBRIDGE. HOUSE SURGEON (in Orthopædic Department) for 6 months from 29th January. Recognised pre-registration service.

Apply to the Secretary by 20th December, stating age, nationality, qualifications and experience, with dates, and with copies of 3 testimonials. Interviews late December early January.

CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS. ADDENBROOKE'S HOSPITAL, CAMBRIDGE. GYNÆCOLOGICAL HOUSE SURGEON (House Officer or Senior House Officer grading) for 6 months from 1st February, 1959. Recognised for pre-registration service and M.R.C.O.G.

Apply to the Secretary by 20th December, stating age, nationality, qualifications and experience, with dates, and with copies of 3 testimonials. Interviews early January.

CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS. ADDENBROOKE'S HOSPITAL, CAMBRIDGE. HOUSE PHYSICIAN for 6 months from 1st February. Recognised pre-registration service.

Apply to the Secretary by 29th December, stating age, nationality, qualifications and experience, with dates, and with copies of 3 testimonials. Interview early January.

CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS. ADDENBROOKE'S HOSPITAL. CLINICAL ASSISTANT (part-time) in the Ophthalmological Outpatient Department for 1 notional half-day per week on Saturday mornings. Consideration is being given to a second weekly session on Tuesday afternoons. The appointment will be for 1 year in the first instance and thereafter subject to annual review. Salary £183 15s. p.a.

Applications, stating age, qualifications and experience, with names of 2 referees, to the Secretary, Addenbrooke's Hospital, by 20th December, 1958.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) E.N.T. and Eye Departments. SENIOR HOUSE OFFICER. Salary £819 10s. p.a. Post vacant January, 1959. Approved for F.R.C.S. and special diplomas.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of SENIOR HOUSE PHYSICIAN is now vacant. Salary £819 10s. p.a., with National Health Service conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of OBSTETRIC HOUSE SURGEON, which is recognised for the M.R.C.O.G. and D.Obst.R.C.O.G., becomes vacant early January, 1959. National Health Service salary and conditions.

Applications, together with 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF. GLAN ELY HOSPITAL, Fairwater, Cardiff. (240 Beds.) SENIOR HOUSE OFFICER required. Tuberculosis, both pulmonary and non-pulmonary, and allied chest conditions are treated. Experience available in thoracic surgery and operative treatment of bone and joint, genitourinary and glandular tuberculosis.

Form of application from Group Secretary, 44, Cathedral-road, Cardiff.

CARDIFF. ST. DAVID'S HOSPITAL. (586 Beds.) Applications invited for post of SENIOR HOUSE OFFICER in Accident Unit at above Hospital, to commence 1st January, 1959. Post offers ample opportunity for practical experience in management of all types of injury under direction of Consultant.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of REGISTRAR in General Surgery at Llandough Hospital, Penarth, to commence duty on 1st February.

Application forms are available from the Secretary to the Board at the Cardiff Royal Infirmary, Newport-road, Cardiff, and should be returned within 14 days of the appearance of this advertisement.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of SENIOR HOUSE OFFICER in General Surgery at the Cardiff Royal Infirmary, to commence duty as soon as possible.

Application forms are available from the Secretary to the Board at the Cardiff Royal Infirmary, Newport-road, Cardiff, and should be returned within 14 days of the appearance of this advertisement.

CARLUKE, LANARKSHIRE. LAW HOSPITAL. (790 Beds.) Applications are invited for the post of RESIDENT GYNÆCOLOGICAL HOUSE OFFICER (pre- or post-registration) for the 6 months commencing 1st February, 1959. The post is recognised for the M.R.C.O.G., and the successful applicant will, if he or she so desires, be given the opportunity of a 6 months' obstetrical post to follow.

Applications, stating age, qualifications and any previous experience, together with the names of 2 referees, should be submitted to the Group Medical Superintendent, Law Hospital, Carluke.

CARMARTHEN. WEST WALES GENERAL HOSPITAL. (280 Beds.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (orthopædic and traumatic surgery—recognised by the Royal College of Surgeons) which is now vacant. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, nationality, and names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. (733 Beds.) HOUSE SURGEON (post approved for pre-registration service). General surgery with duties in genitourinary. Post vacant 12th January, 1959.

Applications, giving age, qualifications, &c., with copies of recent testimonials or the names of 2 referees, should be sent to the Secretary at above address.

CASTLEFORD, NORMANTON AND DISTRICT HOSPITAL. HIGHTOWN, CASTLEFORD. RESIDENT CASUALTY OFFICER (Senior House Officer grade) required. Married accommodation available.

Apply immediately to the Secretary, Pontefract and Castleford Hospital Management Committee, Great Northern House, Salter Row, Pontefract, Yorkshire.

CHESTERFIELD ROYAL HOSPITAL. (269 Beds. Recognised for the D.A. and F.F.A. R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (anæsthetics) required 20th January, 1959. Additional duties when required, at other hospitals in the group. Experience in all types of anæsthesia, except for neurosurgery, can be gained. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 22nd December, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

CHESTER ROYAL INFIRMARY. Chester and District HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT CASUALTY OFFICER (Junior Hospital Medical Officer), vacant 31st January, 1959.

Applications, giving full details, together with the names and addresses of 2 referees, should be forwarded to the Hospital Secretary.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL. (Late Botley's Park War Hospital.) (440 Beds.) RESIDENT HOUSE SURGEON (intern) required. Post recognised for pre-registration service. Salary in accordance with terms and conditions of National Health Service. Post vacant 11th December.

Applications, with names and addresses of referees, to Physician-Superintendent.

CHELTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE. Rotating Internship. A vacancy occurs for a HOUSE PHYSICIAN, pre- or post-registration, at the Cheltenham General Hospital. The successful candidate, on completion of his 6 months, will be offered the post of House Surgeon, followed by that of Resident Obstetric Officer in the Group if desired.

Applications, stating age and experience and names of 2 referees, to be sent to the Group Secretary, General Hospital, Cheltenham.

CHELTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE. Rotating Internship. A vacancy occurs for a HOUSE SURGEON, pre- or post-registration, at the Cheltenham General Hospital. The successful candidate on completion of his 6 months will be offered the post of House Physician, followed by that of Resident Obstetric Officer in the Group, if desired.

Applications, stating age and experience, and names of 2 referees, to be sent to the Group Secretary, General Hospital, Cheltenham.

CHESTER-LE-STREET. GENERAL HOSPITAL. (204 Beds.)

SENIOR HOUSE OFFICER (general surgery). Post vacant 1st February, 1959.

HOUSE PHYSICIANS (general medicine), 2 vacancies. Approved pre-registration appointments. Posts vacant 1st February, 1959.

Apply, with particulars of previous experience and the names and addresses of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute Beds.) RESIDENT HOUSE SURGEON required for 6-month appointment. National salary scales for either provisionally or fully registered practitioners. Post approved for pre-registration practitioners, and F.R.C.S. 8 residents. Vacant 14th January, 1959.

Applications, stating age, experience, qualifications, with references or names of referees, to Senior Administrative Officer.

CHICHESTER. ST. RICHARD'S HOSPITAL. Chichester GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of MEDICAL REGISTRAR, resident or non-resident, mainly at St. Richard's Hospital (400 Beds). Post vacant mid-February, 1959. Registrar will have care of 100 acute medical and pædiatric beds under the supervision of the Consultant Physicians and Pædiatrician, and will also assist the Consultant Neurologist, Chest Physician and Thoracic Surgeon. Salary according to terms and conditions of service of hospital medical staff. Candidates may visit the Hospital.

Forms from Group Secretary, 174, Broyle-road, Chichester, to be submitted within 14 days.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for :—

Essex County Hospital, Colchester, Essex (181 Beds)

Post of SENIOR HOUSE OFFICER to Casualty and Radiotherapy Departments. Post tenable for 6 months or 1 year. Recognised for F.R.C.S.

Black Notley Hospital, Braintree, Essex (522 Beds)

Post of HOUSE SURGEON. Pre-registration or third post. Includes duties in general surgical and gynæcological wards. Recognised for F.R.C.S. Tenable for 6 months.

Clacton and District Hospital, Clacton-on-Sea, Essex (58 Beds)

Post of SENIOR HOUSE OFFICER. Busy general hospital with regular outpatient sessions in all major specialties. Duties include medical, surgical, and casualty work, and the appointment offers practical all-round experience particularly useful to those entering general practice. Post tenable for 6 months or 1 year.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COLWYN BAY AND WEST DENBIGHSHIRE HOSPITAL. COLWYN BAY. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER to the above Hospital of 60 Beds. The Hospital caters for major surgical, orthopædic and medical cases, and there is a small children's ward. Consultants in these specialties visit daily. A comfortably self-contained furnished flat is available. The post offers excellent experience for a suitably qualified candidate (married or single) who is contemplating entering general practice. The post will be vacant on 1st January, 1959.

Applications, with recent testimonials, should be addressed to WILLIAM ROBERTS, Esq., Group Secretary, Clwyd and Deeside Hospital Management Committee, Rhianfa, Russell-road, Rhyl.

COVENTRY AND WARWICKSHIRE HOSPITAL, COVENTRY. HOUSE PHYSICIAN (pre-registration). Resident. Vacant 10th January, 1959.

Applications to Hospital Secretary.

COVENTRY. GULSON HOSPITAL. House Physicians (2 posts) (pre-registration). Vacant 17th January and 16th February, 1959, respectively. Resident.

Applications to Group Secretary, Coventry and Warwickshire Hospital, Stoney Stanton-road, Coventry.

DENBIGH. THE NORTH WALES HOSPITAL FOR NERVOUS AND MENTAL DISORDERS. SENIOR HOUSE OFFICER required. The Hospital has modern treatment facilities, and is recognised by the Conjoint Board for the purpose of their D.P.M. examination. Flat available suitable for married couple without family.

Applications, with names of 2 referees, to the Medical Superintendent.

DORCHESTER. DORSET COUNTY HOSPITAL. House SURGEON (Male or Female) required for resident, pre-registration post now vacant. Recognised for F.R.C.S. examination and tenable for 6 months.

Apply immediately, stating age, qualifications, and enclosing copy testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset.

DERBY. DERBYSHIRE CHILDREN'S HOSPITAL. (86 Beds.) Applications are invited for the post of HOUSE OFFICER or SENIOR HOUSE OFFICER (pædiatrics), vacant 1st January, 1959, tenable for 6 months. Duties mainly surgical but include some medicine. Post recognised for D.C.H. and is open to pre-registration graduates.

Applications, with names of 2 referees, to be sent as soon as possible to Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) HOUSE SURGEON (pre-registration) or SENIOR HOUSE OFFICER (general surgery). Resident. 2 vacancies December. Recognised F.R.C.S. if held by Senior House Officer.

Apply, giving full details and 2 names for reference, to Secretary.

DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL HOSPITAL. (247 Beds.) SENIOR HOUSE SURGEON (Senior House Officer grade). Vacant beginning January. Good general experience, duties include general surgery with some gynaecology.

Detailed applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

DURHAM. DRYBURN HOSPITAL. (310 Beds.)

HOUSE SURGEON (general surgery). Approved pre-registration appointment. Post vacant 1st February, 1959.

HOUSE PHYSICIAN (general medicine). Approved pre-registration appointment. Post vacant 1st February, 1959.

Apply, with names and addresses of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

EDGWARE GENERAL HOSPITAL. (704 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Pathology, non-resident, required at above Hospital. Appointment for 1 year in first instance. Previous experience in pathology desirable. Hospital may be visited by direct arrangement with the Medical Administrator.

Application forms obtainable from and returnable to the Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, Edgware, Middlesex, by 23rd December, 1958.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (647 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Locum Tenens SENIOR REGISTRAR in Diagnostic Radiology required for an indefinite period from 10th January, 1959, at above Hospital. Whole-time services preferred, but part-time offer will be considered.

Apply immediately to the Medical Administrator.

EPPING. ST. MARGARET'S HOSPITAL. House SURGEON (pre- or post-registration) to very busy General Surgical Unit. F.R.C.S. recognition applied for. Hospital within easy reach of Central London. Post vacant 15th January, 1959.

Applications immediately, with copies of testimonials, including 1 from medical school, to reach the Group Secretary, Epping Group Hospital Management Committee, Oak Cottage, The Plain, Epping, Essex.

FAREHAM, HAMPSHIRE. KNOWLE HOSPITAL. KNOWLE GROUP HOSPITAL MANAGEMENT COMMITTEE invite applications for the post of JUNIOR HOSPITAL MEDICAL OFFICER to the above Hospital (Mental). All forms of modern treatment are undertaken; there are regular clinical conferences, a well-stocked medical library, and an active and extensive outpatient organisation. Previous psychiatric experience is not essential, but preference will be given to candidates who intend to specialise in psychiatry. Terms and conditions of service will be as approved for hospital medical staff employed in the National Health Service. Salary £852 10s.–£55–£1182 10s. p.a. The officer will not be required to reside at the Hospital, but single furnished accommodation is available if required.

Requests for application forms should be sent to the Group Secretary, Knowle Hospital, Fareham, Hants.

GLASGOW. BELVIDERE HOSPITAL, London-road, GLASGOW, E.1. 2 HOUSE OFFICERS required for 1st February, 1959. Appointments are for 6 months. Post-registration or pre-registration posts in medicine.

Applications, with names of 2 referees, should be sent to the Physician-Superintendent, Belvidere Hospital, London-road, Glasgow, E.1.

GLASGOW ROYAL INFIRMARY. Junior Hospital MEDICAL OFFICER in Surgery. Duties at above Infirmary.

Applications in writing, supported by the names of 3 referees, to the Secretary and Treasurer, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (146 Beds.) Applications are invited for the pre-registration post of HOUSE SURGEON for General Surgical and Urological Surgery. The Hospital is the main surgical unit in the Group with a resident staff of 4. The post is recognised for F.R.C.S., for which it offers excellent experience. The appointment is for 6 months and falls vacant in mid-January.

Applications, stating age, nationality, qualifications and experience, with copies of 3 recent testimonials, or the names of 2 referees, should be submitted to the Administrator by 15th December, 1958.

HASTINGS. ST. HELEN'S HOSPITAL. (491 Beds.) HOUSE PHYSICIAN required. Pre-registration post vacant 31st December, 1958. Staff of 5.

Applications to Hospital Administrator.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. 2 HOUSE SURGEONS (pre-registration) required. Posts vacant January.

Applications, giving full details and 2 names for reference, should be sent to the Hospital Secretary as soon as possible.

HEMEL HEMPSTEAD. ST. PAUL'S AND WEST HERTS HOSPITALS. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Clinical Pathology required at above Hospitals. Post now vacant. Hospitals may be visited by direct appointment.

Application form obtainable from and returnable to Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Hertfordshire.

HEREFORD. GENERAL HOSPITAL. (154 Beds.) House OFFICER (medicine) required. Pre-registration post.

Applications, with copies of 2 recent testimonials, to Group Secretary, Hospital Management Committee, Victoria House, Eign-street, Hereford.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for the appointment of RESIDENT CASUALTY OFFICER (Senior House Officer grade) with attachment to Paediatrician and Ophthalmic Consultant. Salary £819 10s. p.a., less £150 p.a. residential emoluments. Recognised under F.R.C.S. regulations. Appointment to commence 22nd December, 1958. Applicants offering short-term locum periods considered.

Apply, with full details and references, to Group Secretary, Hertford Hospital Management Committee, Hertford County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for the appointment of HOUSE SURGEON, General (first or second post) to commence 19th January, 1959. Pre-registration post; recognised under F.R.C.S. regulations. Applications will also be considered from fully registered practitioners.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for the appointment of HOUSE SURGEON (general surgery, gynecology and obstetrics) (first or second post). To commence 22nd December, 1958. Pre-registration post, recognised under F.R.C.S. regulations.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HUDDERSFIELD. MILL HILL HOSPITAL. (164 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer grade). £852 10s.–£55–£1182 10s. p.a., at the above Hospital. The present allocation of beds is 28 for infectious diseases and 136 for geriatric patients.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Group Secretary,
Huddersfield Hospital Management Committee.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. (285 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required to commence duty immediately. The post is recognised as a pre-registration appointment and for the F.R.C.S. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Group Secretary,
Huddersfield Hospital Management Committee,
The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. Huddersfield HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from provisionally registered medical practitioners for the post of HOUSE SURGEON to the Princess Royal Maternity Home (57 Beds) to commence duty on 1st February, 1959. The holder of the post, which is recognised for the D.Obst.R.C.O.G., will have access to the abnormal maternity and gynaecological beds at The Royal Infirmary. The Department is under the control of 2 Consultant Obstetricians and Gynaecologists. Salary in accordance with national scale.

Applications, with copies of 3 recent testimonials, to be addressed to the undersigned.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

ILFORD. KING GEORGE HOSPITAL, Eastern-avenue, ILFORD, ESSEX. There will be a vacancy for a HOUSE PHYSICIAN at above Hospital on 23rd January, 1959. First or second post pre-registration. The post will be tenable for 6 months.

Applications, giving full particulars and accompanied by testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Group Secretary,
Ilford and Barking Group
King George Hospital. Hospital Management Committee.

ILFORD. KING GEORGE HOSPITAL, Eastern-avenue, ILFORD, ESSEX. There will be a vacancy for a CASUALTY OFFICER at above Hospital on 29th December, 1958, at a salary of £819 10s. p.a., resident or non-resident. Senior House Officer grade. This post is recognised for the F.R.C.S.

Applications, giving full particulars and accompanied by testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Group Secretary,
Ilford and Barking Group Hospital Management Committee.

IPSWICH. ST. HELEN'S HOSPITAL. (129 Beds for infectious diseases, pulmonary tuberculosis, long-stay orthopaedics and geriatrics. The area Chest Clinic is in the Hospital.) HOUSE PHYSICIAN required (post-registration appointment). Accommodation available for married man.

Applications to JOHN WILLIAMS, Group Secretary, Ipswich Group Hospital Management Committee, at the Ipswich and East Suffolk Hospital (Anglesea-road Wing), Ipswich.

IPSWICH AND EAST SUFFOLK HOSPITAL (Anglesea-ROAD WING). (350 Beds.) Applications invited for SENIOR HOUSE OFFICER to Fracture and Orthopaedic Department. Post recognised for F.R.C.S. examinations. The Department has about 60 Beds and a large outpatient attendance, offering wide experience.

Applications, stating age, nationality and experience, together with copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL (Anglesea-ROAD WING). (350 Beds.) Applications invited for pre-registration post of HOUSE PHYSICIAN, vacant early January.

Applications, stating age, nationality and experience, together with copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL (Heath-ROAD WING). (280 Beds.) HOUSE SURGEON (pre-registration) to General Surgeons.

Applications, with full details and copies of 3 recent testimonials, to Hospital Secretary.

KETTERING AND DISTRICT GENERAL HOSPITAL, NORTHAMPTONSHIRE. Applications are invited for the post of HOUSE SURGEON (pre-registration) vacant now. Post recognised for F.R.C.S.

Applications, stating age, experience and qualifications, together with copies of 3 recent testimonials, to be sent to the Group Secretary at the above address.

KETTERING GENERAL HOSPITAL, Kettering. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER in Paediatrics, vacant 1st January, 1959. Post recognised for D.C.H.

Applications, together with copies of 3 recent testimonials, should be sent to the Group Secretary as soon as possible.

KETTERING GENERAL HOSPITAL, Kettering. (144 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER in Anæsthetics, vacant now. Post recognised for D.A.

Applications, giving details of qualifications and experience, and enclosing copies of 3 recent testimonials, to be sent to the Group Secretary, Kettering and District Hospital Management Committee, at the above address.

KETTERING. ST. MARY'S HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics and Gynæcology at above Hospital. Post vacant early January, 1959. Previous experience is not necessary and the post would provide valuable experience in obstetrics and gynæcology for doctors intending to enter general practice at some future date.

Applications, giving particulars of qualifications and enclosing copies of 3 recent testimonials, should be sent to the Group Secretary, Kettering and District Hospital Management Committee, General Hospital, Kettering.

LANCASTER MOOR HOSPITAL, Lancaster. Applications are invited for the post of SENIOR HOUSE OFFICER in Surgery at the Garnett Clinic, Lancaster Moor Hospital. This is a recently opened undesignated unit, completely modern in all aspects and devoted to neuro, general and orthopædic surgery. The post offers considerable opportunities for experience in all types of surgical work and for preparation for higher degrees. There is a fully equipped Electroencephalographic Department within the Clinic which will offer the successful applicant opportunities for training in the indications for and interpretation of this type of work.

Apply to the Medical Superintendent within 2 weeks of the appearance of this advertisement.

LANCASTER. ROYAL LANCASTER INFIRMARY. (240 Beds.) SENIOR HOUSE OFFICER (surgical). The successful applicant will work with a Consultant Surgical Unit and attend at Consultative Clinics. The post, vacant 1st Janaury next, is recognised for F.R.C.S.

Applications, with names of 2 referees, to Group Secretary, Royal Lancaster Infirmary, Lancaster.

LEEDS, 7. CHAPEL ALLERTON HOSPITAL. (233 Beds.) SENIOR HOUSE OFFICER (medical) required. National Health Service terms and conditions.

Apply Medical Superintendent.

LEEDS REGIONAL HOSPITAL BOARD. Senior Registrar vacancies.

Infectious Diseases

The duties of this post are mainly at Seacroft (Infectious Diseases) Hospital, Leeds (140 infectious diseases beds with a high average occupancy). The post will be resident, and previous experience in infectious diseases is essential.

Pathology

Duties at the Regional Transfusion Centre, Seacroft, with minor relief duties in General Pathology at St. James's Hospital, Leeds. Over 70,000 bottles of blood taken annually. Previous experience in all branches of pathology desirable. Non-resident.

Psychiatry

Duties initially at Scalebor Park Hospital, Burley-in-Wharfedale, Ilkley (396 Beds), and associated hospitals. This Hospital, which has a large proportion of amenity beds, has a high admission rate and active treatment policy and is associated with the Department of Psychiatry, University of Leeds. This post is included in a scheme which is designed to provide maximum facilities for advanced study and training and the person appointed may be seconded at a later date to another hospital within the Region in order to gain further experience. At present there is accommodation at this Hospital for a single person, but the provision of married accommodation at a future date is being considered. Candidates for this appointment must hold the D.P.M. or equivalent qualification.

Applications, stating age, qualifications, and details of present and previous appointments, with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 30th December, 1958.

LEEDS. THE UNITED LEEDS HOSPITALS. Locum SENIOR REGISTRAR in Obstetrics and Gynæcology. Post vacant 1st January, 1959.

Applications, stating age, qualifications and experience, with dates, together with the names of 3 referees, to be sent to the Secretary of the Board, The General Infirmary, Leeds, 1, as soon as possible.

LINCOLN. ST. GEORGE'S HOSPITAL (242 Beds)/ COUNTY HOSPITAL (200 Beds). (Recognised for training in gynæcology for M.R.C.O.G.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (obstetrics and gynæcology) required 22nd February. Duties mainly in gynæcology. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10, by 22nd December, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

LINCOLN COUNTY HOSPITAL. (200 Beds. Recognised training hospital for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required 1st February. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 22nd December, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

LIVERPOOL, 20. BOOTLE HOSPITAL. There is a vacancy for a HOUSE SURGEON. Post recognised for pre-registration service.

Applications, with names of 2 referees, to Secretary, Walton Hospital, Liverpool, 9.

LIVERPOOL, 20. BOOTLE HOSPITAL. There is a vacancy for a HOUSE PHYSICIAN from early February. Post recognised for pre-registration service.

Applications, with names of 2 referees, to Secretary, Walton Hospital, Liverpool, 9.

LIVERPOOL, 9. WALTON HOSPITAL. (1285 Beds.) Vacancies are available on the dates shown for:—

SENIOR HOUSE OFFICER in Regional Neurosurgical Unit, immediately. Recognised for F.R.C.S. diploma. Term of 1 year, renewable.

SENIOR HOUSE OFFICERS in Obstetrics and Gynæcology, immediately for term of 1 year, recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

HOUSE OFFICERS in Orthopædics, immediately. Recognised for F.R.C.S. diploma.

HOUSE PHYSICIANS and HOUSE SURGEONS from 1st March. Recognised for pre-registration service.

Apply to Physician-Superintendent, giving names of 2 referees, and details of age, nationality and qualifications.

MACCLESFIELD HOSPITAL (Infirmary Branch). (100 Beds.) Pre-registration HOUSE OFFICER in Surgery. Acute Surgical Unit of 100 Beds. Recognised for F.R.C.S. purposes. Main casualty duties undertaken by Senior Resident Practitioner.

Apply immediately to Group Secretary, Macclesfield and District Hospital Management Committee, Willerby House, Cumberland-street, Macclesfield, together with names and addresses of 2 referees.

MAIDSTONE. PRESTON HALL CHEST HOSPITAL, BRITISH LEGION VILLAGE, MAIDSTONE, KENT. Applications are invited for the post of SENIOR HOUSE OFFICER at the above Hospital which contains 313 Beds for treatment of pulmonary tuberculosis and other chest diseases, and includes a major thoracic surgical unit. Furnished house available for married applicants. Salary £819 10s. p.a., national scale and conditions.

Applications, stating age, qualifications and experience, with names and addresses of 2 referees, to be sent to the Group Secretary.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (Senior House Officer). Recognised for F.R.C.S. Salary £819 10s. a year, less £150 a year for board and lodging. Post vacant February, 1959.

Applications to the Administrative Officer at the Hospital.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON, 6 months' appointment. Vacant 3rd January, 1959. Recognised for F.R.C.S. Salary at the rate of £467 10s.–£577 10s. p.a. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE PHYSICIAN, 6-month appointment. Post vacant mid-February, 1959. Salary at the rate of £467 10s.–£577 10s. p.a. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MANCHESTER. BAGULEY HOSPITAL. (402 Beds.) SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Chest Diseases. This Hospital is a large Thoracic Unit fully equipped for the medical and surgical treatment of tuberculosis and other chest diseases. Attached to the Hospital is a Chest Clinic. The post offers opportunities for wide experience in medical and surgical treatment of patients suffering from tuberculosis and other diseases of the chest, together with chest clinic work. Ample scope for clinical research.

Applications, stating age, qualifications, nationality, experience, and the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, immediately.

MANCHESTER. BOOTH HALL CHILDREN'S HOS-PITAL, BLACKLEY, MANCHESTER, 9. Regional centre for severe burns and scalds and plastic surgery (unit of 45 Beds).

JUNIOR HOSPITAL MEDICAL OFFICER required for post vacant. £170 deducted for full emoluments.

Applications, giving names and addresses of 2 referees, to be sent to Group Secretary, from whom further particulars may be obtained.

MANCHESTER REGIONAL HOSPITAL BOARD. NORTH AND MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR (chest disease) required to carry out duties arranged by the Consultant Chest Physician at the Altrincham, Northwich, Crewe Clinics and The Grange Hospital, Weaverham, and such other duties as may arise at any hospital within the North and Mid and South Cheshire Groups.

Applications, together with 2 recent testimonials, should be sent to the Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR required 15th February, 1959, in the Blackburn and District Group with duties mainly at Queen's Park Hospital, Blackburn (640 mainly general beds). Post recognised for F.R.C.S. A furnished house will be available, on rental, for a married man.

Application forms obtainable from the Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD. Bury AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. FAIRFIELD AND ROSSENDALE GENERAL HOSPITALS. Applications are invited for the post of REGISTRAR in Obstetrics and Gynæcology. Post recognised for examinations of the D.Obst.R.C.O.G. Accommodation available for married officer.

Apply, stating full details and names of 2 referees, to H. WILKINSON, Group Secretary, Bury General Hospital, Bury, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. WITHINGTON HOSPITAL, MANCHESTER, 20. The Board invite applications from registered practitioners for the post of MEDICAL REGISTRAR at the above-named Hospital.

Applications, stating age, qualifications, and previous experience, together with the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER, 20. CHRISTIE HOSPITAL AND HOLT RADIUM INSTITUTE. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered practitioners for the post of ASSISTANT RESIDENT SURGICAL OFFICER (Senior House Officer grade). The post provides experience in the treatment of tumours and good opportunity for study.

Applications, with full details, including the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, immediately.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar grade).

Application forms may be obtained from the undersigned.

H. R. NORTH,
General Superintendent, Manchester Royal Eye Hospital.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited from registered medical practitioners, Male or Female, for the post of HOUSE PHYSICIAN in the Neonatal Unit of Saint Mary's Hospitals (attached to the University Department of Child Health) for a period of 6 months, vacant 1st February, 1959. Previous hospital experience essential and pædiatric experience desirable. Duties include the care of the newborn in the Maternity Department, the care of infants in the infants' ward, and work in the clinics under the charge of the Department of Child Health. Salary in accordance with national scale.

Applications, stating qualifications and experience, together with the names of 3 referees, should be sent to the undersigned not later than 22nd December, 1958.

A. R. WISE, General Superintendent.
Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. SENIOR HOUSE OFFICER (surgical) to commence middle of March, 1959. Whole-time, mainly non-resident training post, tenable for 6 months, renewable for second 6 months. Duties allotted in orthopædic, surgical outpatients and general surgical units in rotation. Resident alternate nights for 3 months when attached to orthopædic unit.

Application form obtainable from the Secretary, to be returned by 27th December, 1958.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (orthopædics) required at the above Hospital. This post offers excellent experience for persons who ultimately intend to specialise in orthopædic and accident work. In addition to the routine orthopædic duties of a general hospital, the unit carries out the reconstruction surgical programme of patients from the Devonshire Royal Hospital, Buxton, which has a regional catchment area.

Applications, with full details and the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, as soon as possible.

MANCHESTER, 23. WYTHENSHAWE HOSPITAL, SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered practitioners for the post of SENIOR HOUSE OFFICER in E.N.T. Surgery with duties at Wythenshawe and Withington Hospitals.

Applications, with the names of 2 referees, to be submitted to the Group Secretary, Withington Hospital, Manchester, 20, immediately.

MANSFIELD AND DISTRICT GENERAL HOSPITAL. (205 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT MEDICAL REGISTRAR required 23rd January. This post offers experience in acute general medicine (50 Beds) and pediatrics (12 Beds). Married accommodation available. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 22nd December, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

MIDDLESBROUGH. HEMLINGTON HOSPITAL. South TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (surgery) at the above Hospital. The appointment is recognised for the F.R.C.S. examinations. The Hospital does not have a Casualty Department.

Applications, stating age, qualifications and experience, together with 2 names for reference, should be sent to the Hospital Secretary.

MIDDLESBROUGH. HEMLINGTON HOSPITAL (202 Beds.) SOUTH TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (gynæcology) at the above Hospital. This post is recognised for pre-registration service and offers wide experience in gynæcology.

Applications, stating age and qualifications, together with 2 names for reference, should be addressed to the Hospital Secretary.

MIDDLESBROUGH. NORTH ORMESBY HOSPITAL. (184 Beds.) SOUTH TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON to Surgical Team No. 1 at the above Hospital. The post is recognised for pre-registration service.

Applications, stating age, qualifications and experience and giving names for reference, should be addressed to the Hospital Secretary as soon as possible.

MIDDLESBROUGH. NORTH ORMESBY HOSPITAL. (184 Beds.) SOUTH TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (surgery) to Surgical Team No. 2 at the above Hospital. The post is recognised for pre-registration service.

Applications, stating age, qualifications and experience, together with 2 names for reference, should be sent to the Hospital Secretary.

MEDWAY AND GRAVESEND HOSPITAL MANAGE- MENT COMMITTEE. Locum E.N.T. REGISTRAR required from 14th December, until permanent appointment made. Salary £19 5s. per week.

Applications to Group Secretary, 20, Star Hill, Rochester, Kent, with full details of experience and names of 2 referees.

MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT ANÆSTHETIST for joint duties at the West Kent General Hospital, and the Kent County Ophthalmic and Aural Hospital, Maidstone (total beds 254). The post, which is of Senior House Officer grade, carries a salary of £819 10s. a year less £150 for residential emoluments. Excellent experience under Consultant Anæsthetists is available, and the post is recognised for the F.F.A. R.C.S. examination.

Applications, stating age, nationality, qualifications and experience, together with the names of 2 suitable referees, should be forwarded to the Administrative Officer, West Kent General Hospital, Maidstone.

MITCHAM. WILSON HOSPITAL, Cranmer-road, MITCHAM, SURREY. RESIDENT HOUSE PHYSICIAN (not pre-registration). Vacant now.

Applications, stating age, qualifications, &c., with the names and addresses of 2 referees, to the Secretary at above address.

MORECAMBE. QUEEN VICTORIA HOSPITAL. (100 Beds.) RESIDENT CASUALTY OFFICER (Junior Hospital Medical Officer grade). Post vacant 1st January, 1959.

Applications, with names of 2 referees, to Group Secretary, Royal Lancaster Infirmary, Lancaster.

NEWCASTLE REGIONAL HOSPITAL BOARD. Regis- TRAR ANÆSTHETIST, whole-time, for Sunderland Group of hospitals (1950 Beds). Post offers practical experience under supervision of visiting anæsthetists and is recognised for F.F.A. R.C.S. and D.A. Opportunity will be given to attend Newcastle Medical School for lectures.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Regis- TRAR SURGEON, whole-time, for North Tees-side Group of hospitals—Sedgefield General (336 Beds). Modern furnished or unfurnished self-contained flat (5 rooms) available, also single accommodation. Post recognised for F.R.C.S. examination.

Applications, with the names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the whole-time non-resident appointment of SENIOR REGISTRAR in the Department of Psychological Medicine at the Royal Victoria Infirmary under the direction of the Professor of Psychological Medicine. Applicants should possess either a Diploma in Psychological Medicine or a higher qualification in general medicine and psychiatric experience. The appointment is for 1 year in the first instance and will be subject to the terms and conditions of service of hospital medical staff in the National Health Service.

Applications, giving full details and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne.

NEWTON ABBOT HOSPITAL. Resident Senior House SURGEON, Male or Female, required immediately, to act as Casualty Officer and House Surgeon to special departments, together with relief duties. Ability to give outpatient anæsthetics advantageous. Married quarters available.

Applications (quoting reference F.364/41), stating qualifications, nationality, age, with copy testimonials, to be sent to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, South Devon.

NOTTINGHAM EYE HOSPITAL. Senior House Officer (ophthalmology) required. Duties to commence on 23rd December, 1958. Salary and conditions of service in accordance with Ministry regulations.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Pre-registra- tion HOUSE SURGEONS required. Duties to commence end January/beginning February, 1959.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Senior House OFFICER (anæsthetics) required about 1st January, 1959. The post is recognised for the D.A. and the F.F.A. R.C.S. This is a busy general hospital, giving experience in all branches of surgery.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Senior House OFFICER (orthopædic and fracture) required. Duties to commence early January, 1959. Post offers exceptional experience in traumatic surgery.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Senior House OFFICER (surgery) required. Duties to commence about 19th January, 1959.

Applications, stating age, qualifications, experience and nationality, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Resident Pre-registration HOUSE PHYSICIANS required. Posts vacant mid-January, 1959, and early February, 1959.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. E.N.T. Department. A SENIOR HOUSE OFFICER (E.N.T.) required at the above Hospital. This post is recognised for the D.L.O. and F.R.C.S. examinations. Salary and conditions of service in accordance with Ministry regulations. Duties to commence as soon as possible.

Applications, stating age, qualifications, experience, and nationality, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (casualty). Duties to commence as soon as possible.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Secretary, General Hospital, Nottingham.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applications are invited for the post of HOUSE SURGEON (pre-registration) SENIOR HOUSE OFFICER, vacant 1st February, 1959.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applications are invited for the post of RESIDENT PATHOLOGIST (Senior House Officer). Previous experience an advantage. Post vacant 1st January, 1959.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in the Department of Thoracic Surgery. Post vacant in January, 1959.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, should be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell, NOTTINGHAM. SENIOR HOUSE OFFICER (surgical) required. Duties to commence 5th January, 1959. Good opportunity for suitable candidate to gain experience in operating. This post is an excellent one for candidate who wishes to sit for Final F.R.C.S. examination in the near future.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Hospital Secretary.

NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell, NOTTINGHAM. Applications are invited from fully qualified medical practitioners for the post of SENIOR HOUSE OFFICER (obstetrics) in the Obstetrical and Gynæcological Departments (48 obstetrical beds, 11 gynæcological beds, and a small block for puerperal pyrexia). This Hospital is recognised for training for the D.Obst.R.C.O.G. Duties to commence on 1st January, 1959. Preference will be given to candidates who have experience in obstetrics and gynæcology. Terms and conditions of service as laid down by the Ministry of Health.

Apply, stating age, qualifications, and experience, together with copies of testimonials, to Hospital Secretary.

NORWICH. ST. ANDREW'S HOSPITAL, Thorpe, NORWICH. Applications are invited from registered medical practitioners (Male or Female) for the appointment of SENIOR HOUSE OFFICER (psychiatric). The Hospital has 1250 Beds, an admission-rate of over 750 annually, and affords comprehensive experience in psychiatry. The salary and conditions of service will be as laid down by the Ministry for Senior House Officers. Residential accommodation with board available.

Applications, stating age, qualifications and full particulars of experience, together with the names and addresses of 2 referees, to be sent as soon as possible to the Medical Superintendent.

NUNEATON. GEORGE ELIOT HOSPITAL. House OFFICER in General Surgery. Recognised pre-registration and F.R.C.S. Resident.

Applications to Hospital Secretary, George Eliot Hospital, Nuneaton.

NUNEATON. MANOR HOSPITAL. Senior House Officer in Anæsthetics. Resident or non-resident. Recognised D.A., F.F.A. R.C.S.

Applications to Hospital Secretary.

ORPINGTON HOSPITAL, Orpington, Kent (telephone Orp. 27050). Applications invited for Pre-registration HOUSE SURGEONS for :—

(i) Orthopædics and E.N.T.

(ii) Gynæcology and Ophthalmology.

Posts offer good experience in large General Hospital pleasantly situated within easy reach of London.

Apply immediately to Surgeon-Superintendent.

OSWESTRY. ROBERT JONES AND AGNES HUNT ORTHOPÆDIC HOSPITAL. REGISTRAR in Orthopædics, resident or non-resident. Experience specialty and higher surgical qualification desirable.

Application forms from Secretary to be returned by 20th December, 1958. Candidates may visit Hospital.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in Obstetrics and Gynæcology to the hospitals of the Aylesbury area. It is hoped that this post may be interchangeable with a post in the Area Department of Obstetrics and Gynæcology, United Oxford Hospitals, after the first year. The appointment is for 1 year, eligible for extension to a second year. Vacant now.

Applications, on forms obtainable from the Secretary, Registrars Committee, 43, Banbury-road, Oxford, should reach him by 23rd December.

OXFORD. THE UNITED OXFORD HOSPITALS. The RADCLIFFE INFIRMARY. Applications are invited for the post of REGISTRAR/RESEARCH ASSISTANT to the Accident Service to commence on 14th January, 1959. The duties of this post will be divided equally between the clinical duties of the Registrar appointment, and research work in the Department, under the supervision of the Director of the Accident Service.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be received as soon as possible.

OXFORD. UNITED OXFORD HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER in the Accident Service, Radcliffe Infirmary, commencing 1st February, 1959, for a period of 6 months.

Applications, stating age, qualifications and experience, together with 2 names for reference purposes, should be received by the Administrator, Radcliffe Infirmary, by 3rd January.

PLYMOUTH. SCOTT ISOLATION HOSPITAL. House PHYSICIAN (resident, Male), post vacant 9th January, 1959. Recognised pre-registration post which offers excellent experience.

Applications to the Group Secretary, Plymouth Special Hospital Management Committee, 8, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH. SCOTT ISOLATION HOSPITAL. PLYMOUTH SPECIAL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER from Male registered medical practitioners who have preferably been qualified for 1 year, and have had previous hospital experience. The duties, in 2 departments, will be chiefly in connection with infectious and venereal diseases, the former including a substantial proportion of cases in children. The varied clinical work, including acute medical cases, provides valuable experience, particularly to those reading for a higher medical degree, or contemplating general practice. The appointment will be for 1 year, vacant on 1st January, 1959. There is accommodation for either a married or single candidate.

Applications, together with copies of 2 recent testimonials, should be sent to the Group Secretary, Plymouth Special Hospital Management Committee, 8, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, Greenbank-road, PLYMOUTH. HOUSE PHYSICIANS, pre-registration posts, vacancies 1st and 14th January, 1959.

Apply with names of 3 referees, also stating age, nationality, qualifications and experience, to the Group Secretary, 7, Nelson-gardens, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

HOUSE SURGEON, pre-registration post, vacant immediately. Devonport Section.

HOUSE SURGEONS, pre-registration posts, vacancies, 2 on 1st January, 1959. Freedom Fields Section.

HOUSE SURGEONS, pre-registration posts, vacancies 1 immediately, and 9th January, 1959. Greenbank-road Section.

All posts are recognised for the F.R.C.S.

Apply with names of 3 referees, also stating age, nationality, qualifications and experience, to the Group Secretary, 7, Nelson-gardens, Plymouth.

PONTEFRACT GENERAL INFIRMARY. House Surgeon required. This is an approved pre-registration post under Medical Act, 1950, but applications will be considered from fully registered practitioners. Hospital approved under F.R.C.S. regulations and provides excellent surgical experience. Married accommodation available. Post vacant 19th December, 1958.

Applications as soon as possible to the Secretary, Pontefract and Castleford Hospital Management Committee, Great Northern House, Salter-row, Pontefract, Yorkshire.

PONTYPRIDD AND RHONDDA HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited for the following vacancies:—

(1) Locum HOUSE OFFICER (pædiatrics) until 31st January, 1959, at the East Glamorgan Hospital, Church Village, near Pontypridd.

(2) HOUSE OFFICER (medicine) at the Llwynypia Hospital, Llwynypia, Rhondda. Person appointed will also be required to undertake duties at the Glyncornel Hospital (56 chronic Beds) and Tyntyla Isolation Hospital (42 Beds).

Applications, stating age, qualifications and experience, together with copies of 2 testimonials, to be sent immediately to the Group Secretary, Courthouse-street, Pontypridd.

PAISLEY. ROYAL ALEXANDRA INFIRMARY. House SURGEON required for Orthopædic and Fracture Unit. Resident. Pre- or post-registration.

Applications to Group Medical Superintendent.

PAISLEY. ROYAL ALEXANDRA INFIRMARY. Junior HOSPITAL MEDICAL OFFICER required for Orthopædic and Fracture Unit. Resident.

Applications to Group Medical Superintendent.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SURGICAL REGISTRAR with duties mainly at Saint Mary's Hospital (120 surgical beds). Vacant 1st January, 1959. The post will include duties in the Department of Thoracic Surgery (15 Beds). The successful candidate must hold the F.R.C.S.

Application forms, obtainable from the Group Secretary, Saint Mary's Hospital, Portsmouth, returnable by 22nd December, 1958. Canvassing will disqualify. Candidates may visit the Hospital by arrangement with the Group Secretary.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Saint Mary's Hospital. Surgery—120 surgical beds

HOUSE OFFICER (pre-registration). Vacant 30th January, 1959.

Royal Portsmouth Hospital. Medical—61 medical beds

HOUSE OFFICER (pre-registration). Vacant 19th January, 1959.

SENIOR HOUSE OFFICER required in Orthopædic Department (104 orthopædic beds). Vacant now.

Queen Alexandra Hospital. Medical—78 medical beds

HOUSE OFFICER (pre-registration). Vacant 1st January, 1959.

Saint Mary's Hospital

SENIOR HOUSE OFFICER (anæsthetics). Vacant now. Post offers experience in most branches of anæsthesia, including thoracic surgery, midwifery, and respiratory poliomyelitis. 6 Consultant Anæsthetists practise in the Group.

SENIOR HOUSE OFFICER (obstetrics and gynæcology) (82 obstetric and 50 gynæcological beds). Vacant now. Post recognised for M.R.C.O.G.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST, St. Mary's Hospital, Milton-road, Portsmouth.

PRESTON ROYAL INFIRMARY. (409 Beds.) Preston AND CHORLEY HOSPITAL MANAGEMENT COMMITTEE. MANCHESTER REGIONAL HOSPITAL BOARD. ORTHOPÆDIC REGISTRAR. Post vacant 1st January, 1959. Recognised for F.R.C.S.

Application forms obtainable from Group Secretary, Royal Infirmary, Preston, Lancs.

RHYL, FLINTSHIRE. ROYAL ALEXANDRA HOSPITAL. Applications are invited for the post of RESIDENT HOUSE PHYSICIAN (pre-registration or otherwise). The successful applicant will work in a busy Acute Medical Unit of 52 Beds under the direction of the Consultant Physician and Medical Registrar.

Applications, stating age and experience, with copies of 2 testimonials, to be sent forthwith to the Group Secretary, Clwyd and Deeside Hospital Management Committee, Rhianfa, Russell-road, Rhyl.

ROCHFORD. GENERAL HOSPITAL. (620 Beds.) SENIOR HOUSE OFFICER required for Geriatric Unit (130 Beds) at the above Hospital. Post vacant 1st January, 1959. A wide range of facilities are available for the investigation, treatment and rehabilitation of acute and chronic inpatients and outpatients.

Applications, stating age, &c., to be sent to the Secretary as soon as possible.

ROCHFORD GENERAL HOSPITAL, Essex. (620 Beds.) RESIDENT SENIOR HOUSE OFFICER required to work in the Chest Unit (72 Beds) at the above Hospital and at the Lancaster House Chest Clinic, Southend-on-Sea, to commence approximately mid-January. Good experience in general medicine essential, and previous experience in tuberculosis and diseases of the chest desirable.

Applications, stating age, &c., to the Secretary by 27th December, 1958.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. RESIDENT PATHOLOGIST (Senior House Officer grade). This post, now vacant, provides valuable experience by rotation through all departments of this large Group Laboratory and is recognised for the purposes of the Diploma in Pathology. Prospective candidates are invited to visit the laboratory.

Applications should be sent, with testimonials or the names of 2 referees, as soon as possible to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER required from 19th January, 1959, in the Obstetric and Gynæcological Unit consisting of 88 obstetric and 52 gynæcological beds. Post recognised for the D.Obst.R.C.O.G. and M.R.C.O.G.

Applications should be addressed to the Secretary, Romford Group Hospital Management Committee, at the Hospital as soon as possible.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) RESIDENT GYNÆCOLOGICAL AND OBSTETRIC HOUSE SURGEON (preferably Female) required from 27th January, 1959. Post recognised for pre-registration (surgical). Qualified medical practitioners may apply. Unit comprises 35 gynæcological and 6 obstetric beds for abnormal midwifery (about 200 deliveries per year).

Applications should be addressed immediately to the Medical Superintendent, stating names of 2 referees.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) RESIDENT HOUSE PHYSICIAN (Male or Female) required from 23rd January, 1959. This Hospital provides for acute medical, surgical and infectious patients. The post, which is also open to pre-registration candidates, offers good opportunities for gaining experience in both fevers and general medicine.

Applications should be addressed immediately to the Medical Superintendent, stating names of 2 referees.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) RESIDENT HOUSE OFFICER (general surgery), Male or Female, required from 6th January, 1959. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications should be forwarded immediately to Medical Superintendent, stating also names of 2 referees.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE OFFICERS (surgery) required immediately for busy Surgical Units in Birch Hill Hospital and Rochdale Infirmary. These posts are recognised for F.R.C.S. qualification and offer excellent experience.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIANS required at Birch Hill Hospital. 3 resident posts available in December/January.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

SALISBURY GENERAL HOSPITAL. Applications are invited for the combined appointment of HOUSE SURGEON AND HOUSE PHYSICIAN to run consecutively in this order for a period of 6 months in each post from 19th February, 1959. Vacancy for Locum House Surgeon available for 16th December to 18th February. Posts open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. South West Metropolitan REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR HOUSE OFFICER in Anæsthetics (resident) at above Hospital which has special units. Recognised for the F.F.A. R.C.S.

Applications, as soon as possible, to the Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SCOTLAND. NORTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in General Surgery on the staff of the Aberdeen General Hospitals.

Applications, together with the names of 2 referees, should be forwarded by 3rd January, 1959, to the Senior Administrative Medical Officer, 1, Albyn-place, Aberdeen, from whom further particulars and a form of application may be obtained.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Radiotherapy at the Royal Infirmary and Western General Hospital, Edinburgh, vacant on 1st March, 1959.

Apply, giving particulars of age, qualifications and previous experience, and the names of 3 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 3rd January, 1959.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

SENIOR REGISTRAR in Obstetrics and Gynæcology at the Royal Maternity Hospital and Royal Samaritan Hospital for Women, Glasgow.

SENIOR REGISTRAR in Psychiatry based at the Glasgow Royal Mental Hospital.

REGISTRAR in Psychiatry based at Woodilee Hospital, Lenzie, Glasgow. Small flat available.

REGISTRAR in Medicine based at the Royal Infirmary, Glasgow.

REGISTRAR in Surgery based at the Western Infirmary, Glasgow, and with duties for a period at the Lewis Hospital, Stornoway, or at the Vale of Leven Hospital, Alexandria, Dunbartonshire.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 27th December, 1958.

SCUNTHORPE. WAR MEMORIAL HOSPITAL. (262 Beds.) Vacancy end of January for HOUSE PHYSICIAN (resident), Senior House Officer/pre-registration, busy department with general medicine, pædiatrics, skins, and eyes, large outpatient clinics all offering good opportunity for acquiring experience.

Applications, naming 2 referees, to Group Secretary, Scunthorpe Hospital Management Committee.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR REGISTRAR (non-resident) in Venereology required for clinics in the Sheffield area. Appointment for 1 year in first instance. Reviewable annually. Possession of a higher qualification desirable.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 22nd December, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the following posts :—

(*a*) REGISTRAR or SENIOR HOUSE OFFICER in General Medicine at the Royal Infirmary. Grade according to qualifications and experience. Post vacant 25th January, 1959. Closing date for applications 19th December, 1958.

(*b*) REGISTRAR in General Medicine (non-resident) at the Royal Hospital. Closing date for applications 19th December, 1958.

(*c*) SENIOR HOUSE OFFICER in Plastic Surgery, Royal Hospital. Post vacant February, 1959. Closing date for applications 19th December, 1958.

(*d*) SENIOR HOUSE OFFICER in Anæsthetics, Royal Infirmary. Post vacant now. Applications immediately.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be addressed as follows:

Posts (*a*) and (*b*): Chief Administrative Officer, United Sheffield Hospitals, West-street, Sheffield, 1.

Post (*c*): Superintendent, Royal Hospital, Sheffield, 1.

Post (*d*): Superintendent, Royal Infirmary, Sheffield, 6.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. CHILDREN'S HOSPITAL/JESSOP HOSPITAL. Applications invited for the post of REGISTRAR or SENIOR HOUSE OFFICER at the above hospitals, in association with the Department of Child Health in the University of Sheffield. The post is a rotating one between the 2 hospitals, so that the successful candidate will spend part of his time in charge of the newborn babies at the Jessop Hospital, a period in the Professorial Department at the Children's Hospital, and a further period undertaking the medical care of surgical patients at the Children's Hospital. Post vacant 1st January, 1959.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent immediately to Chief Administrative Officer, United Sheffield Hospitals, West-street, Sheffield, 1.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) RESIDENT ANÆSTHETIST (Senior House Officer). Post recognised for F.F.A. R.C.S. Registrar also employed. Vacant 24th January, 1959.

Applications and copy testimonials to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) SENIOR HOUSE OFFICER (gynæcological). 50 gynæcological beds and 2 House Surgeons. Posts recognised for M.R.C.O.G. Vacant early January, 1959.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY/COP-THORNE HOSPITAL. (500 Beds.) Senior House Officer to work as CLINICAL PATHOLOGIST to Group Laboratory. Appointment tenable for 1 year, resident or non-resident. Recognised for Diploma in Pathology. Vacant 1st January, 1959. A Unit of the Public Health Laboratory service is housed in the same building and there are facilities for training in all the 4 main branches of pathology.

Applications to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury, naming 3 referees.

SOUTHAMPTON GENERAL HOSPITAL. (465 Beds. Recognised for F.R.C.S.) RESIDENT HOUSE SURGEON required. Pre-registration candidate eligible.

Applications should be forwarded to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton, with copies of recent testimonials.

SOUTHAMPTON GROUP OF HOSPITALS. South West METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR to the Geriatric Department of the above Group. The department is in the charge of a Consultant Physician and consists of an Admission Unit of 61 Beds in the Southampton General Hospital and 297 long-stay beds in other hospitals in the Group. There is a close link with the Local Authority, and order of priority for admission to Hospital is assessed by an initial domiciliary visit. Post offers opportunity to work for higher degrees. A flat (unmarried quarters) is available in one of the hospitals if required.

Forms of application, which may be obtained from the undersigned, should be returned not later than Wednesday, 31st December, 1958. FRANK JENNINGS, Group Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SOUTH EAST NORTHUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following pre-registration appointments which become vacant early in January, 1959.

Preston Hospital
1 HOUSE PHYSICIAN.
Tynemouth Victoria Jubilee Infirmary
1 HOUSE PHYSICIAN.
1 HOUSE SURGEON.

Applications, quoting 2 referees, to Group Secretary, Preston Hospital, North Shields.

SOUTHPORT GENERAL INFIRMARY. (189 Beds. Recognised for pre-registration.)
HOUSE PHYSICIAN (general medicine).
HOUSE PHYSICIAN (general medicine and ophthalmology).
HOUSE SURGEON (general surgery).
HOUSE SURGEON (general surgery and gynæcology).

Appointments vacant January. House Surgeon posts recognised for F.R.C.S.

Apply, stating age, qualifications, nationality, experience, and post required, with 2 copy testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

STAFFORD. STAFFORDSHIRE GENERAL INFIR-MARY. (175 Beds—Recovery Unit 32 Beds.) HOUSE SURGEON. Pre-registration post. Vacant January. At end of service the successful applicant will be considered for pre-registration post of House Physician if he or she has not held such an appointment.

Applications to Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STAFFORD. STAFFORDSHIRE GENERAL INFIR-MARY. RESIDENT CASUALTY OFFICER required. Junior Hospital Medical Officer status.

Applications, with names for reference, to Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

ST. LEONARDS-ON-SEA. BUCHANAN HOSPITAL. (91 Beds.) Locum HOUSE SURGEON (gynæcology) required from 22nd to 28th December inclusive. Salary £10 9s. a week, less board.

Apply, with names of 2 referees, to the Administrator.

ST. LEONARDS-ON-SEA. BUCHANAN HOSPITAL. (91 Beds. Obstetric, Gynæcological and Premature Baby Unit.) SENIOR HOUSE OFFICER required for Obstetric and Premature Baby Unit. Appointment, recognised for M.R.C.O.G., is vacant 8th January, 1959.

Applications, giving names and addresses of 3 referees, should be addressed to the Hospital Administrator.

ST. ASAPH, FLINTSHIRE. GENERAL HOSPITAL. (54 obstetric beds.) Applications are invited from pre-registration or registered medical practitioners for the post of HOUSE OFFICER. Recognised for the M.R.C.O.G. and D.Obst.R.C.O.G. Post vacant 1st February, 1959. Tenable for 6 months. Married quarters available.

Applications, together with 2 testimonials, to be sent immediately to the Group Secretary, Clwyd and Deeside Hospital Management Committee, Rhianfa, Russell-road, Rhyl.

ST. ASAPH HOSPITAL, St. Asaph, Flintshire. Appoint-ment of HOUSE OFFICER. Duties divided between ophthalmology (16 Beds), E.N.T. (12 Beds), and oral surgery (4 Beds).

Applications, stating age, qualifications and experience, accompanied by 2 recent testimonials, to be sent forthwith to the Group Secretary, Clwyd and Deeside Hospital Management Committee, Rhianfa, Russell-road, Rhyl.

STOCKPORT AND BUXTON HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics) with duties at Stepping Hill Hospital, Stockport (529 Beds), and Stockport Infirmary (163 Beds). The post is recognised for the D.A. and F.F.A. R.C.S., and there are ample opportunities for study. It is vacant 20th January, 1959.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw Heath, Stockport.

STOCKPORT. STEPPING HILL HOSPITAL. Applica-tions are invited for the post of SENIOR HOUSE OFFICER (obstetrics and gynæcology), vacant 1st February, 1959. The post is recognised for the D.Obst.R.C.O.G.

Applications, with full particulars and copies of 2 recent testimonials, to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw Heath, Stockport.

SURBITON. ROYAL EYE HOSPITAL, Upper Brighton-road, SURBITON, SURREY. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of Full-time OPHTHALMIC REGISTRAR for duties at the Surbiton unit of the Royal Eye Hospital, S.E.1. Previous experience essential, primary F.R.C.S. desirable. The appointment is for 2 years, but is subject to review at the end of the first year.

Forms of application from the Group Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to be returned not later than 3rd January, 1959.

SUTTON AND CHEAM HOSPITAL, Cotswold-road, SUTTON, SURREY. RESIDENT SENIOR HOUSE OFFICER (Casualty Officer). Post recognised for F.R.C.S. Vacant now.

Applications, stating age, qualifications and experience, with copies of recent testimonials and the names of 2 referees, to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Resident Pre-registration HOUSE SURGEON required for general surgical unit of 80 Beds at Victoria Hospital, Swindon. Recognised for F.R.C.S. Married accommodation available.

Full details, giving names of 3 referees, to Secretary, 7, Okus-road, Swindon.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE PHYSICIAN (pre-registration) required for Acute Medical Unit of 64 Beds at St. Margaret's Hospital.

Full details, with names of 3 referees, to Secretary, 7, Okus-road, Swindon.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. SENIOR HOUSE PHYSICIAN required. Duties primarily in association with the Neurology Department and to act as deputy to the Resident Medical Officer (Senior House Officer grade).

Applications, with copy testimonials, to the Hospital Secretary as soon as possible.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICERS (general surgery) required. Pre-registration. 2 posts vacant early January. Recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Hospital Secretary, North Staffordshire Royal Infirmary, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post vacant very shortly. Some duties also at Hartshill Orthopædic Hospital.

Detailed applications, with copy testimonials, to Hospital Secretary.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (medicine and dermatology) required. Recognised pre-registration.

Applications, with copy testimonials, to the Secretary at the Royal Infirmary, as soon as possible.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (medicine and pædiatrics) required. Recognised pre-registration.

Applications, with copy testimonials, to the Secretary at the Royal Infirmary as soon as possible.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. SENIOR HOUSE OFFICER (anæsthetics) required. Post vacant shortly. Recognised for F.F.A. R.C.S. and D.A.

Applications, with copy testimonials, to the Secretary at the Royal Infirmary as soon as possible.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (815 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (general surgery) required. 6-month appointment. The post offers wide experience in general surgery. No casualty work. Recognised for the F.R.C.S.

Applications to the Hospital Secretary.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. Applications invited for HOUSE OFFICER (medical), vacant early January. Recognised pre-registration post.

Detailed applications to the Secretary at the Hospital.

TAPLOW, MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. OBSTETRICAL AND GYNÆCOLOGICAL REGISTRAR required, resident or non-resident. Post recognised for M.R.C.O.G.

Application forms from and returnable to Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 3rd January.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. Locum REGISTRAR in Obstetrics and Gynæcology required from 18th December for approximately 3 months.

Applications, with names of 2 referees, to Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. Applications are invited for the post of HOUSE PHYSICIAN to the Special Unit for Research in Juvenile Rheumatism, vacant 18th January. Post offers scope for those interested in research, paediatrics, rheumatology, or cardiology.

Applications, stating age, qualifications and experience, with dates, with copies of 2 testimonials, to Secretary.

TAUNTON AND SOMERSET HOSPITAL, Taunton, SOMERSET. HOUSE OFFICER (E.N.T.) required. Post vacant early January. Post-registration appointment, recognised for F.R.C.S. and D.L.O.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, c/o Musgrove Park Hospital, Taunton.

TAUNTON AND SOMERSET HOSPITAL, Taunton, SOMERSET. JUNIOR HOSPITAL MEDICAL OFFICER, Male or Female, required for full-time, resident casualty and orthopædic work.

Applications, stating age, nationality, qualifications and experience, to the Group Secretary, Taunton Hospital Management Committee, c/o Musgrove Park Hospital, Taunton.

TAUNTON AND SOMERSET HOSPITAL, Taunton, SOMERSET. HOUSE OFFICER (general surgery) required. Pre-registration post. Recognised for F.R.C.S. Post vacant 14th January, 1959.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, c/o Musgrove Park Hospital, Taunton.

TORQUAY. TORBAY HOSPITAL. (180 acute general beds.) HOUSE OFFICER (medicine), Male or Female, required for last week of November. Pre-registration appointment. General duties which will include some work in the E.N.T., the Ophthalmic, and Radiotherapy Departments.

Applications, stating qualifications, nationality, age, together with copy testimonials (quoting reference F.955/91), to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

WALSALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Manor Hospital (340 Beds)
HOUSE PHYSICIANS (2).

General (Sister Dora) Hospital (181 Beds)
HOUSE PHYSICIANS (2).

The above Hospitals are acute general hospitals situated in a densely populated industrial area and give wide experience in all branches of medicine and surgery. Posts recognised for pre-registration. Duties mainly acute medical, with opportunities for additional experience in cardiology, chest diseases, diabetes, and dermatology.

Applications, together with names of 2 referees, to Group Secretary, Walsall General (Sister Dora) Hospital.

WALSALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Manor Hospital (340 Beds)
HOUSE SURGEONS (2).

General (Sister Dora) Hospital (181 Beds)
HOUSE SURGEONS (2).

The above Hospitals are acute general hospitals situated in a densely populated industrial area and give wide experience in all branches of medicine and surgery. Posts recognised for pre-registration. Hospitals recognised by R.C.S. Opportunities for experience in general surgery, orthopædics, gynæcology, and E.N.T. surgery.

Applications, together with names of 2 referees, to Group Secretary, Walsall General (Sister Dora) Hospital.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST (Male or Female) (graded as Senior House Officer). The post will be vacant early in January. The Hospital is recognised for the D.A. examination. Salary is £819 10s. p.a., less a deduction of £150 p.a. for residential emoluments.

Applications, stating qualifications and experience, should be sent to HENRY L. BOOT, Group Secretary, Warrington and District Hospital Management Committee, c/o General Hospital, Warrington, Lancs.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR (infectious diseases) based Hill House Isolation Hospital, Swansea (130 Beds), to serve Glantawe Hospital Management Committee. Resident.

REGISTRAR (general surgery), St. Woolos Hospital, Newport, Mon. (379 Beds). Post covers 56 Beds, recognised F.R.C.S. 6 months. Non-resident. Vacant 5th April, 1959.

REGISTRAR (general medicine) Caernarvon and Anglesey General Hospital, Bangor (130 Beds), further extension opening shortly. Non-resident. Vacant 6th April, 1959.

Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. (211 Beds.) Applications are invited for the post of HOUSE PHYSICIAN at the above Hospital. Pre-registration post vacant 14th January, 1959. Salary in accordance with the National Health Service scale.

Please send applications, with copies of 2 recent testimonials, to the Administrator.

WEST BROMWICH AND DISTRICT HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the following appointments. Pre-registration :—

West Bromwich and District General Hospital (144 Beds)
1 HOUSE PHYSICIAN.
1 HOUSE SURGEON.

Hallam Hospital (430 Beds)
2 HOUSE PHYSICIANS.
2 HOUSE SURGEONS.
2 HOUSE OFFICERS (obstetrics and gynæcology).

These posts will be vacant 8th January, 1959.

Applications, with 3 recent testimonials, to Group Secretary, West Bromwich and District Hospital Management Committee, Edward-street, West Bromwich.

WEST CUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Anæsthetics required immediately for service in West Cumberland Group based on Workington Infirmary.

Applications, with dates and names of 2 referees, to Group Secretary, Workington Infirmary, Cumberland.

WESTON-SUPER-MARE GENERAL HOSPITAL. (104 Beds.) Applications are invited from duly qualified medical practitioners for the pre-registration appointment of HOUSE PHYSICIAN. Single residential accommodation provided. Vacant January, 1959.

Applications, stating age, qualifications, together with names and addresses of 2 referees, should be addressed to the Group Secretary, Weston-super-Mare Hospital Management Committee.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (324 Beds.) SENIOR HOUSE OFFICER, Pathological Department. Vacant 1st January, 1959. Preferably resident. Duties will include training in the various branches of clinical pathology, especially hæmatology. Previous experience in clinical pathology desirable, but not essential.

Applications, with copies of 2 testimonials, to the Hospital Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. Registrar (Casualty Officer), resident or non-resident, required immediately. There is an Accident Unit of 30 Beds at the Hospital and, with the Casualty Department, forms part of the Accident Service for the Windsor Group. Candidates should have had previous experience in the treatment of acute injuries.

Application forms obtainable from, and returnable to, Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor.

WINDSOR. KING EDWARD VII HOSPITAL. House PHYSICIAN required, Male or Female, for post vacant 10th January. Pre-registration post.

Applications, stating age, qualifications, with dates, and nationality, with copies of 3 recent testimonials, to Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. Resident SURGICAL REGISTRAR required mid-February.

Application forms obtainable from and returnable to Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 31st December.

WOKING, SURREY. VICTORIA HOSPITAL. (72 Beds.) SENIOR HOUSE OFFICER (post-registration appointment) required for medical, surgical and casualty duties.

Apply, with 2 testimonials, to Hospital Secretary.

WOKING. THE ROWLEY BRISTOW ORTHOPÆDIC HOSPITAL, PYRFORD, WOKING, SURREY. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR, resident or non-resident, at the above Hospital for 1 year in the first instance. (A small house may be available for rental if required.) The duties entail some outpatient work at St. Thomas's Hospital, London.

Applications to be on forms obtainable from the Group Secretary at the above address, and completed forms should be returned within 14 days of the date of this advertisement. Canvassing will disqualify, but candidates may visit the Hospital.

WORCESTER ROYAL INFIRMARY (213 Beds) and RONKSWOOD HOSPITAL, WORCESTER (243 Beds). REGISTRAR (general surgery). Higher qualification desirable. Post recognised for F.R.C.S.

Application forms from Secretary, Worcester Royal Infirmary, Worcester, to be returned by 22nd December, 1958.

WORKINGTON INFIRMARY, Cumberland. (174 Beds, pre-registration post, recognised F.R.C.S.(Ed.).) HOUSE SURGEON (first, second, or Senior House Officer post). Vacant beginning of November.

Detailed applications with dates, and names of 2 referees, to Group Secretary.

WORTHING HOSPITAL, Lyndhurst-road, Worthing, SUSSEX. Applications are invited from registered medical practitioners, or pre-registration candidates, for the posts of HOUSE PHYSICIAN and HOUSE SURGEON at Worthing Hospital, vacant mid-January.

Applications, stating age, qualifications, experience, nationality, together with copies of 2 recent testimonials, to Hospital Secretary.

A. V. OAKTON, Group Secretary,
Worthing Group Hospital Management Committee.

WOLVERHAMPTON. NEW CROSS HOSPITAL. (634 Beds.) SENIOR HOUSE OFFICER IN MEDICINE. Acute medical beds. Vacant early part of January.

Applications to Hospital Secretary.

WOLVERHAMPTON. ROYAL HOSPITAL. Pre-regis-tration HOUSE OFFICER (general surgery). Post recognised for F.R.C.S. 2 vacancies in January.

Apply, with copies of 2 testimonials, to the Secretary.

WOLVERHAMPTON. ROYAL HOSPITAL. Locum HOUSE OFFICER (general surgery) required for approximately 2 months, with a view to a 6-month appointment. Post recognised for F.R.C.S.

Apply, with copies of 2 testimonials, to the Secretary.

WREXHAM. MAELOR GENERAL HOSPITAL (591 Beds). WAR MEMORIAL HOSPITAL, WREXHAM (230 Beds). Applications are invited for HOUSE SURGEON posts at the above Hospitals, to commence duties on 1st February, 1959. The appointments are recognised for the Diploma of F.R.C.S. (England, Edinburgh, and Ireland) and are pre-registration posts.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, as soon as possible.

WREXHAM. MAELOR GENERAL HOSPITAL (591 Beds). WAR MEMORIAL HOSPITAL, WREXHAM (230 Beds). Applications are invited for HOUSE PHYSICIAN posts at the above Hospitals, to commence 1st February, 1959. The appointments are recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to the Group Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, Denbighshire.

WREXHAM. MAELOR GENERAL HOSPITAL. (591 Beds.) Applications are invited for the post of PÆDIATRIC HOUSE PHYSICIAN at the above Hospital, to commence 1st February, 1959. The appointment is recognised for the D.C.H., and for pre-registration purposes.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to the Group Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, Denbighshire.

WREXHAM. WAR MEMORIAL HOSPITAL. (230 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in the Orthopædic Department of the above Hospital, commencing 1st February, 1959. The post is a residential one and affords particular facilities for postgraduate study. Successful applicant will be allowed to attend for 2 days a month at the Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry. The Hospital is recognised for the Diploma of F.R.C.S. (England, Edinburgh, and Ireland).

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, to be addressed to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

WREXHAM (near). TREVALYN MANOR MATERNITY HOSPITAL, ROSSETT, near WREXHAM. (47 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital, to commence duties on 1st February, 1959. The Hospital is a Part II midwifery training school and deals with normal and abnormal midwifery. This Hospital will be transferred in March, 1959, to a new Maternity Unit at the Maelor General Hospital, Wrexham.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

DUBLIN. ST. KEVIN'S HOSPITAL. The Dublin Board of Assistance invites applications for appointment to the position of REGISTRAR IN PATHOLOGY (resident).

Salary: First year £720 10s. p.a.; second year £827 p.a.; third year £933 10s. p.a., plus full board and residence. Credit may be allowed on salary scale for each previous year's experience as a Registrar, and an additional £100 p.a. is payable for a higher qualification in pathology. St. Kevin's Hospital is recognised for the purpose of the Diploma in Pathology.

Full particulars and application forms may be obtained from the Establishment Department, 1, James's-street, Dublin. Completed application forms must be returned not later than 31st December, 1958. J. J. NOLAN, Secretary.

CANADA. KINGSTON, ONTARIO. KINGSTON GENERAL HOSPITAL. Canadian teaching hospital of Queen's University offers approved ROTATING INTERNSHIPS for 12 months commencing 1st July, 1959. Vigorous intern-training programme. Opportunities for further appointments to more senior clinical posts and to research fellowships. Honorarium $100 per month plus full residential emoluments. Senior Medical appointment $175 per month also available.

Apply Superintendent, Kingston General Hospital, Kingston, Ontario.

MICHIGAN, U.S.A. OAKWOOD HOSPITAL, Dearborn, MICHIGAN. Applications are invited for 1- or 2-year approved GENERAL PRACTICE RESIDENCY in modern 234-Bed general hospital 10 miles from Detroit. Excellent facilities. Hospital approved for Exchange-Visitor programme. Beginning monthly salary $250 if single, $300 if married. Free housing.

Apply: Director.

U.S.A. SAINT ELIZABETH HOSPITAL, Elizabeth, NEW JERSEY. 1-year ROTATING INTERNSHIP, A.M.A. approved. New programme in Community-Teaching Hospital. Medical Education and Research Department staffed by 35 carefully-selected Physicians who provide bedside and lecture teaching in specialties. Full-time staff members in pathology, medical education, radiology, all of whom have university faculty appointments. All patients teaching cases—active service department and clinics for interns. Courses available nearby Graduate Medical School, several conducted in Hospital, tuition paid by Hospital. Interns invited twice monthly for grand rounds at outstanding New York hospitals. Hospital located 20 miles from New York City. Limited vacancies for period 1st July, 1959–30th June, 1960. $125 monthly and maintenance.

Write: CHARLES R. REAM, M.D., Saint Elizabeth Hospital, Elizabeth 2, New Jersey.

U.S.A. VETERANS ADMINISTRATION HOSPITAL. RESIDENT HOUSE PHYSICIAN in Medicine. Training approved by American Examining Board in specialty. Salary $3000 first year to $5000 fourth year. This 500-Bed Hospital is a general teaching hospital integrated with the State University of Iowa College of Medicine and the University Hospital of 1500 Beds. Credit may be given for previous approved training. There are 6 British Physicians presently on University Hospital permanent staff in senior positions. Applicants must pass the examination of Educational Council for Foreign Medical Graduates (located at 1710, Orrington Avenue, Evanston, Illinois, U.S.A.). The examination is given in February and September. Write above address for examination in Britain.

Applications received by the Manager, U.S. Veterans Administration Hospital, Iowa City, Iowa, U.S.A.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOSPITAL. The Board of Management invites applications for the following appointments which will become vacant on 1st April, 1959:—

HOUSE OFFICERS (pre-registration).

Candidates must be provisionally registered practitioners and must be prepared to serve in any of the following departments:—

Medicine, Surgery, Obstetrics, or Pædiatrics.

The duration of the appointments will be for 12 months (2 departments) or 6 months in the case of a candidate who has already completed a 6-month pre-registration appointment.

HOUSE OFFICERS (post-registration).

Candidates must be fully registered medical practitioners and must be prepared to serve in any of the following departments:—

Medicine, Surgery, Obstetrics, Anæsthetics, Pædiatrics, or General Outpatients.

The duration of the appointment will be for 1 year, 6 months to be spent in each of 2 departments.

House Officers will, as far as possible, serve in the department of their choice, but the number of vacancies in any department is limited and it is not always possible to observe individual preferences.

Salaries:—

House Officer (pre-registration): £660 p.a.

House Officer (post-registration): £1164 p.a., plus inducement addition of £270 p.a. for expatriates.

The appointments will be for 1 tour of 12 months.

On satisfactory completion of service a gratuity of £37 10s. will be paid to post-registration House Officers for each completed term of 3 months' service.

An outfit allowance of £60 is payable on first appointment.

Partly-furnished quarters are provided at a rental of 8½% of salary excluding inducement allowance. An expatriate doctor appointed will be eligible for 7 days' leave on full pay for each completed month of service in Nigeria. A Nigerian doctor will be eligible for 5 days' leave for each completed month.

Free first-class passages are provided for expatriate doctors on first appointment, on vacation leave, and on completion of their agreement. Free first-class passages to Nigeria will, in certain circumstances, be provided for Nigerian doctors. Doctors will be eligible for children's allowances in accordance with the existing regulations.

Arrangements can be made to enable doctors to continue their National Health Service superannuation scheme contributions, and details of the revised salary and gratuity payable in such cases will accompany application forms.

Applications should be submitted not later than 27th December, 1958, on the appropriate forms which will be forwarded together with additional information on receipt of an addressed foolscap envelope by the Adviser on Staff Recruitment, London Office, University College Hospital, Ibadan, 57, Catherine-place, Palace-street, London, S.W.1.

Public Appointments

NAVY, ARMY, AND AIR FORCE INSTITUTES. Applications are invited from medical practitioners (Male) for the part-time appointment (3 sessions weekly) of ASSISTANT MEDICAL OFFICER at the London Headquarters of this Corporation. Candidates should have considerable experience of general medicine, including experience in general practice. Remuneration will be in accordance with British Medical Association salary scale for Industrial Medical Officers.

Applications, stating age, qualifications and experience, should be sent to Chief Medical Officer, Navy, Army, and Air Force Institutes, Imperial Court, Kennington-lane, London, S.E.11, not later than 29th December, 1958.

BOLTON. COUNTY BOROUGH OF BOLTON. Applications are invited for the appointment of MEDICAL OFFICER OF HEALTH AND PRINCIPAL SCHOOL MEDICAL OFFICER. The salary scale for the post is £2390–£2655, which includes an amount in respect of duties as Medical Referee for the purpose of the Cremation Acts.

Forms of application and conditions of appointment may be obtained from the undersigned, to whom applications should be delivered not later than 22nd December, 1958.

Town Hall, Bolton. PHILIP S. RENNISON, Town Clerk.

THE MEDICAL SERVICE OF THE ROYAL NAVY

VACANCIES FOR MEDICAL OFFICERS

Candidates are invited for Short Service Commissions of 3 years, on termination of which a gratuity of £600 (tax free) is payable. Ample opportunity is granted for transfer to Permanent Commissions on completion of 1 year's total service. Officers so transferred are paid instead a grant of £1500 (taxable).

All entrants are required to be British subjects whose parents are British subjects, medically qualified, physically fit, and to pass an interview.

Full particulars from the Admiralty Medical Department, Queen Anne's Mansions, St. James's Park, London, S.W.1.

COVENTRY CORPORATION require School Medical OFFICER AND ASSISTANT MEDICAL OFFICER OF HEALTH (joint post) for duties connected with medical inspection and clinic treatment of schoolchildren, maternity and child welfare work, and such other duties as the Medical Officer of Health and Principal School Medical Officer may include from time to time. Qualifications experience in ascertainment of handicapped pupils an advantage. Salary £1050–£1475. Commencing salary according to experience/qualifications. Removal loan available.

Application forms, &c., from Medical Officer of Health, New Council Offices, Coventry, returnable without delay.

STOKE-ON-TRENT. CITY OF STOKE-ON-TRENT EDUCATION COMMITTEE. Applications are invited for the post of SENIOR SCHOOL MEDICAL OFFICER. Salary scale £1520–£1955 p.a. Consideration will be given to previous experience when fixing the initial salary. Contributory superannuation. Candidates should have considerable experience as a School Medical Officer. The appointment is terminable by 3 months' notice on either side. The successful candidate will be required to pass a medical examination.

Application forms and further particulars are obtainable from the undersigned, P.O. Box No. 23, Town Hall, Hanley, Stoke-on-Trent, to whom they should be returned not later than 30th December, 1958. H. DIBDEN, Chief Education Officer.

SURREY COUNTY COUNCIL. Ophthalmic Medical PRACTITIONER, part-time, for County Council eye clinics at Woking, Camberley and Haslemere, a total of 3 sessions per week. Remuneration at the rate of 6 guineas per session of 3 hours' duration or pro rata for lesser periods. Travelling expenses in accordance with Whitley Council agreement. Candidates should hold a Diploma in Ophthalmology.

Applications, stating age, qualifications and experience, together with the names of 2 referees, should reach the County Medical Officer, County Hall, Kingston-upon-Thames, by 29th December, 1958.

FEDERATION OF RHODESIA AND NYASALAND. Vacancy RADIOLOGIST, Ministry of Health.

Duties: Radiodiagnosis and may include the training of Radiographers for the M.S.R. diploma.

Salary: £2450 p.a. fixed. Senior posts on a fixed salary of £2750 p.a. exist and these are normally filled by promotion from within the Service.

Application forms and further particulars from the Secretary (R), Rhodesia House, 429, Strand, London, W.C.2. Closing date, 17th January.

GOVERNMENT OF BRITISH GUIANA. Medical Superintendent required to take charge of Mental Hospital at Berbice. Duties include the supervision of staff, patients, revenue and expenditure, and the psychiatric clinic held monthly at Georgetown. Appointment on contract for 3 years. Total emoluments £2700 p.a. (i.e., £2000 p.a. salary plus £250 p.a. in lieu of consultation fees and £450 p.a. gratuity payment payable at 6-monthly intervals or in lump sum on completion of engagement). Income-tax at local rates. Free quarters provided, but small charge made for furniture. Free passages for officer, wife, and children under 18, not exceeding 5 persons in all. Generous home leave on completion of appointment. A National Health Service candidate may retain his superannuation rights but receive total emoluments of £2650 p.a. (the gratuity rate being £400 p.a.). Candidates must possess qualifications registrable in the United Kingdom and have had 2 years' experience in mental hospitals. Diploma in Psychological Medicine highly desirable.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD.117/30/05).

GOVERNMENT OF QATAR. PERSIAN GULF. Applications are invited for the post of RADIOLOGIST in the Qatar State Medical Department. Salary is on scale 2700 rupees per month (equivalent to £2430 p.a.), rising by annual increments of Rs. 100 to a maximum of Rs. 3300 per month. Point of entry according to qualification. Contract is for 2 years or longer with probationary period of 6 months. Gratuity payable on termination of contract. Leave is six days for each month on duty and is taken annually. Free fully furnished accommodation, fuel, light, water, medical treatment, car, and return passages provided. No income-tax. Applicants should have a D.M.R.D. London or equivalent qualifications with experience of radiotherapy. Knowledge of Arabic an advantage. Radiologist is responsible for first-class radiological unit in modern hospital.

Applications, in duplicate, should be addressed to C. TENNANT SONS AND CO., LTD., 4, Copthall-avenue, London, E.C.2, giving full personal particulars, including photograph, and details of qualifications, experience, and employment, to arrive not later than 31st December, 1958.

GOVERNMENT OF TRINIDAD. Applications invited from doctors with medical qualifications registrable in the United Kingdom for following posts:—

MEDICAL OFFICERS Grade B (Institutions) for general medical, surgical and other duties of Hospital Medical Officer in any institution in the Colony. Higher qualification, or more than 6 years' approved post-registration experience, required. Salary scale £1400–£1500 a year.

MEDICAL OFFICERS Grade C (Institutions) for general duties of a Resident Medical Officer in any medical institution in the Colony. Salary scale £950–£1350 a year.

Appointment on permanent basis with pension (non-contributory) at rate of 1/600th of final pensionable emoluments for each completed month of service; or on short-term contract for 3 years in first instance with gratuity (taxable) £25–£37 10s. for each completed period of 3 months' service, or from National Health Service with retention of superannuation rights up to 6 years plus gratuity (taxable) of 20% of aggregate salary. Quarters, if available, at low rental or allowance in lieu. Free passages on appointment for officer and family not exceeding 5 persons in all. Leave passages on certain conditions up to 3 adult fares. Income-tax at local rates. Generous leave. Educational facilities.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD.117/38/07).

BLACKPOOL. COUNTY BOROUGH OF BLACKPOOL. DEPUTY MEDICAL OFFICER OF HEALTH. Applications for this appointment (salary £1380 rising to £1650) are invited from duly qualified medical practitioners possessing the Diploma in Public Health.

Terms and conditions from the Medical Officer of Health, Municipal Health Centre, Whitegate-drive, Blackpool. Closing date 22nd December, 1958. ERNEST C. LEE, Town Clerk.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointment as Appointed Factory Doctor is vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
GLASTONBURY ..	SOMERSET ..	3RD JANUARY, 1959

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

LEEDS (East and North). Applications invited for Vacancy (residential and industrial) due to death. Intermediate area. List approximately 1761. Premises available (fullest details later). Apply on E.C.16A before 31st December, 1958, to the Clerk, Leeds Executive Council, Trevelyan Chambers, 7, Boar-lane, Leeds, 1.

Miscellaneous

Medical Officer required by B.B.C. to act as Assistant (full-time) to the Medical Adviser. Duties cover a wide field and will include examination of staff, advice on physical working conditions and on problems with a medical aspect, correspondence and discussions with doctors treating members of staff, and attendance at meetings where a medical point of view is required. Wide and varied clinical experience essential, experience in industrial medicine and a higher medical qualification an advantage. Preferred age 35–45, but consideration given to those outside it where qualifications are particularly strong. Starting salary within range £2000–£2500 p.a., according to experience and qualifications.—Requests for application forms (enclosing addressed envelope and quoting reference G.920 LCT) should reach Appointments Officer, Broadcasting House, London, W.1, within 5 days.

CLINICAL RESEARCH OFFICER

The above vacancy occurs in the Research Department of an international company manufacturing surgical and orthopædic dressings, pharmaceuticals and proprietary medical products. To this important position will be appointed a well-qualified medical man of good personality, possessing in marked degree the qualities of enthusiasm, initiative and drive. His duties will lie essentially in cooperating with the various research teams in the development of improved or new products; in planning and supervising of clinical trials; and in advising on the medical aspects of promotional literature. Previous experience in a similar position will be an advantage, but is not essential.

An attractive salary and excellent prospects await the right candidate.—Full details in strict confidence to Address No. 448, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

MANAGER required by company holding leading position in the development and supply of equipment to hospitals, clinics and medical practitioners. Electromedical, physiotherapy, remedial. Proved administrative and some selling experience in this field desirable. Excellent prospects. 30–45 age group.—Address No. 447, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Principal Medical Officer required immediately for a large Tea Company in India, with central and estate hospitals. Age preferably between 30 and 45 years. 3-year agreement. Commencing salary and allowances the rupee equivalent of £260 per month. Bungalow with basic furniture, lighting, heating and servants free. Car provided.—Applications, with 3 names for reference purposes, to Box 417, c/o WALTER JUDD LTD., 47, Gresham-street, E.C.2.

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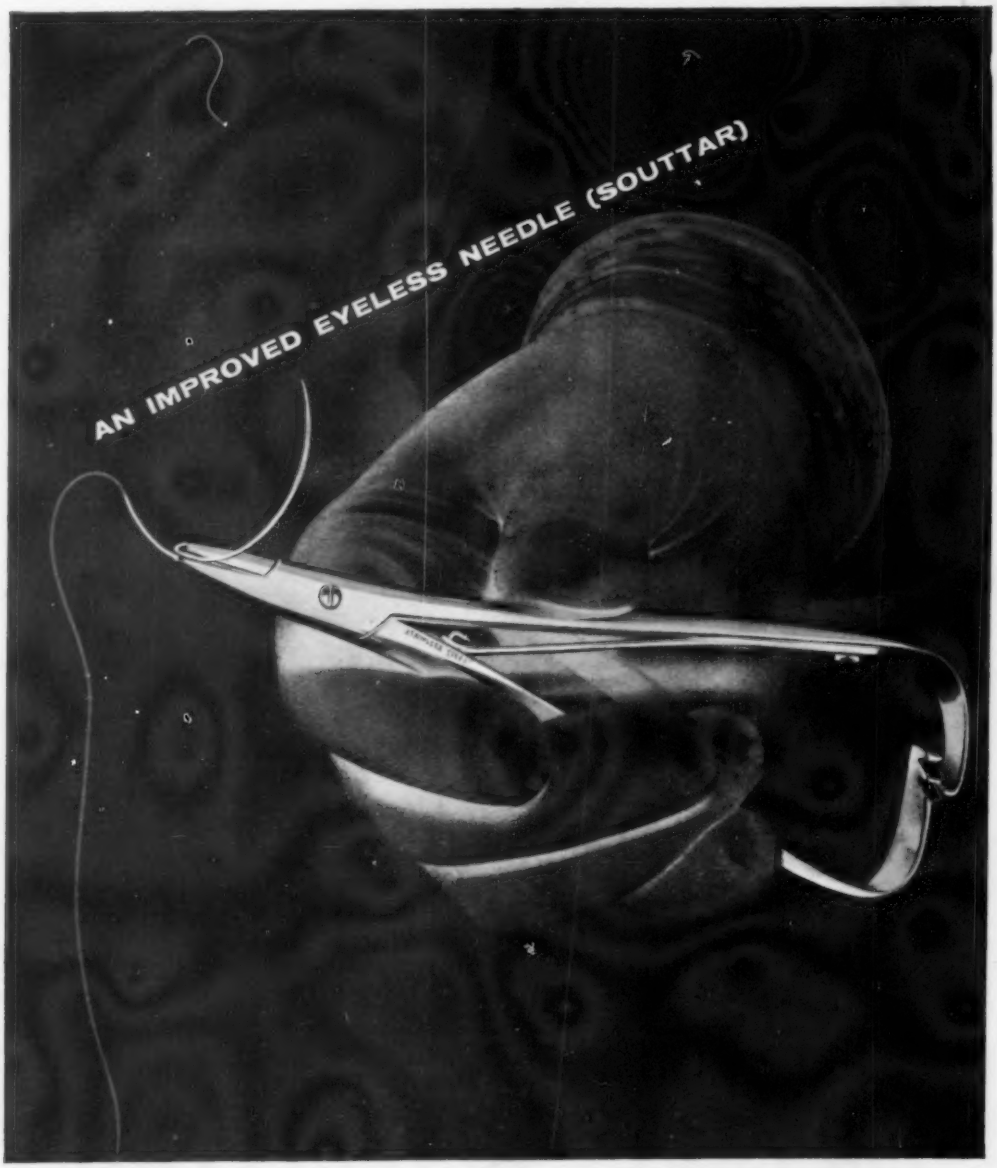

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